OKI

OKIPAGE 20
LED Page Printer

Troubleshooting Manual with Component Parts List

ODA/OEL/INT

All specifications are subject to change without notice.

40692901TH

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1. OUTLINE

This manual has been written to provide guidance for troubleshooting of the OKIPAGE 20 Printer (primarily for its printed circuit boards), on an assumption that the reader is knowledgeable of the printer. Read the maintenance manual for this printer P/N 40300001TH if necessary.

Notes:

1. The power supply board containing a high voltage power supply is dangerous. From the viewpoint of the safety standards, the local repairing of a defective board is not allowed. Thus, the objects to be locally repaired as a result of troubleshooting are switches and fuses.
2. Replacement of CPU (MHM2029K) is not recommended. If CPU is founded to be defective, board replacement is suggested.

2. TOOLS

For troubleshooting the printer, the tools listed below may be needed in addition to general maintenance tools.

Tool	Remarks
Oscilloscope	Frequency response 100 MHz or higher
Soldering iron	A slender tip type, 15-20 Watt

3. CIRCUIT DESCRIPTION

3.1 Outline

The control board controls the reception of data transferred through a host I/F and processes command analysis, bit image development, raster buffer read. It also controls the engine and the operator panel. Its block diagram is shown in Fig. 3-1.

(1) Reception control
The OKIPAGE 20 has one centronics parallel I/F port and one RS-232C serial I/F port.
Two I/F ports which receives data first can be used automatically.
The other I/F port outputs a busy state.
The centronics parallel I/F port can specify the following item when set by the control panel:

PARALLEL SPEED	:	HIGH/MEDIUM
BI-DIRECTION	:	ENABLE/DISABLE
I-PRIME	:	OFF/ON

The RS-232C serial I/F port can specify the following item when set by the control panel.

Flow control	:	DTRHI/DTRLO/XONXOFF/RBSTXON
Baud rate	:	300/600/1200/2400/4800/9600/19200 (Baud)
Data bit	:	7/8 (bit)
Minimum busy time	:	200/1000 (ms)
Parity	:	NONE/ODD/EVEN

An interface task stores all data received from the host into a receive buffer first.

(2) Command analysis processing
The OKIPAGE 20 has the following emulation mode.

Laser Jet Series V	:	Hewlett Packard
Proprinter III XL	:	IBM
FX	:	EPSON
PostScript Level 2	:	Adobe (Only when the PostScript SIMM is installed additionally.)

An edit task fetches data from the receive buffer, analizes commands, and reconstructs the data in such a way that print data are aligned from up to down and from right to left; then it writes the resultant data into a page buffer with such control data as print position coordinate, font type, etc. added.

(3) Font Processing
When one page editing is finished, a developing task makes an engine start and fetches data from the page buffer synchronizing with a printing operation; then it developes the fetched data to a bit map as referring to data from a character generator, and writes the resultant data into the raster buffer (of band buffer structure).

(4) Raster buffer read.
As controlling the engine operation, an engine task sends data from the raster buffer to the LED head.

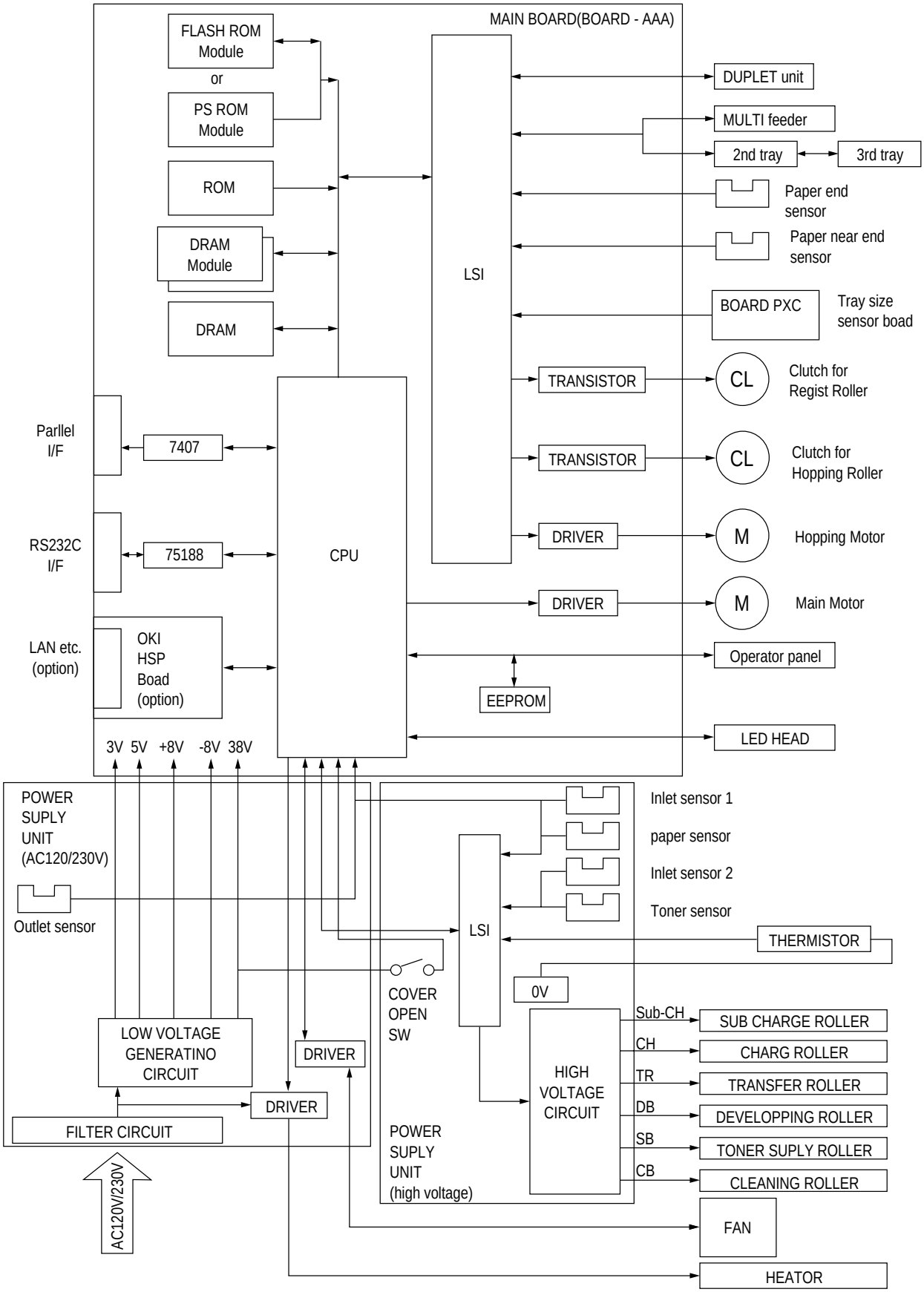


Figure 3-1 Block Diagram

3.2 CPU and Memory

(1) CPU (MHM2029-003K-41)
CPU core : RISC CPU (MIPS R3000 compatible)
CPU clock : 40.5504 MHz
Data bus width : Exterior 32 bits, Interior 32 bits

(2) ROM (HP LaserJet V emulation)
ROM capacity : 6 Mbytes (24-Mbit mask ROM two pieces)
ROM type : 24 Mbits (1.5M x 16 bits)
Access time : 100 ns

(3) Option ROM (SIMM: one slot)
PostScript SIMM or FLASH SIMM

- PostScript SIMM (Adobe PostScript emulation)
  ROM capacity : 4 Mbytes (16 Mbit mask ROM two pieces)
  ROM type : 16 Mbits (2M x 16 bits)
  Access time : 100 ns
- FLASH SIMM
  ROM capacity : 4 Mbytes (8 Mbit FLASH ROM four pieces)
  or 8 Mbytes (16 Mbit FLASH ROM four pieces)
  ROM type : 8 Mbits (1M x 8 bits) or 16 Mbits (2M x 8 bits)
  Access time : 90 ns

(4) Resident RAM
RAM capacity : 4 Mbytes (16 Mbit D-RAM two pieces)
RAM type : 16 Mbits (1 M x 16 bits)
Access time : 60 ns

(5) Option RAM (SIMM: two slots)
RAM capacity : Max. 32 Mbytes (4 Mbytes, 8 Mbytes, 16 Mbytes, 32 Mbytes)
Access time : 60 ns, 70 ns, 80 ns, 100 ns

The block diagram of CPU and memory circuits is shown in Fig. 3-2.

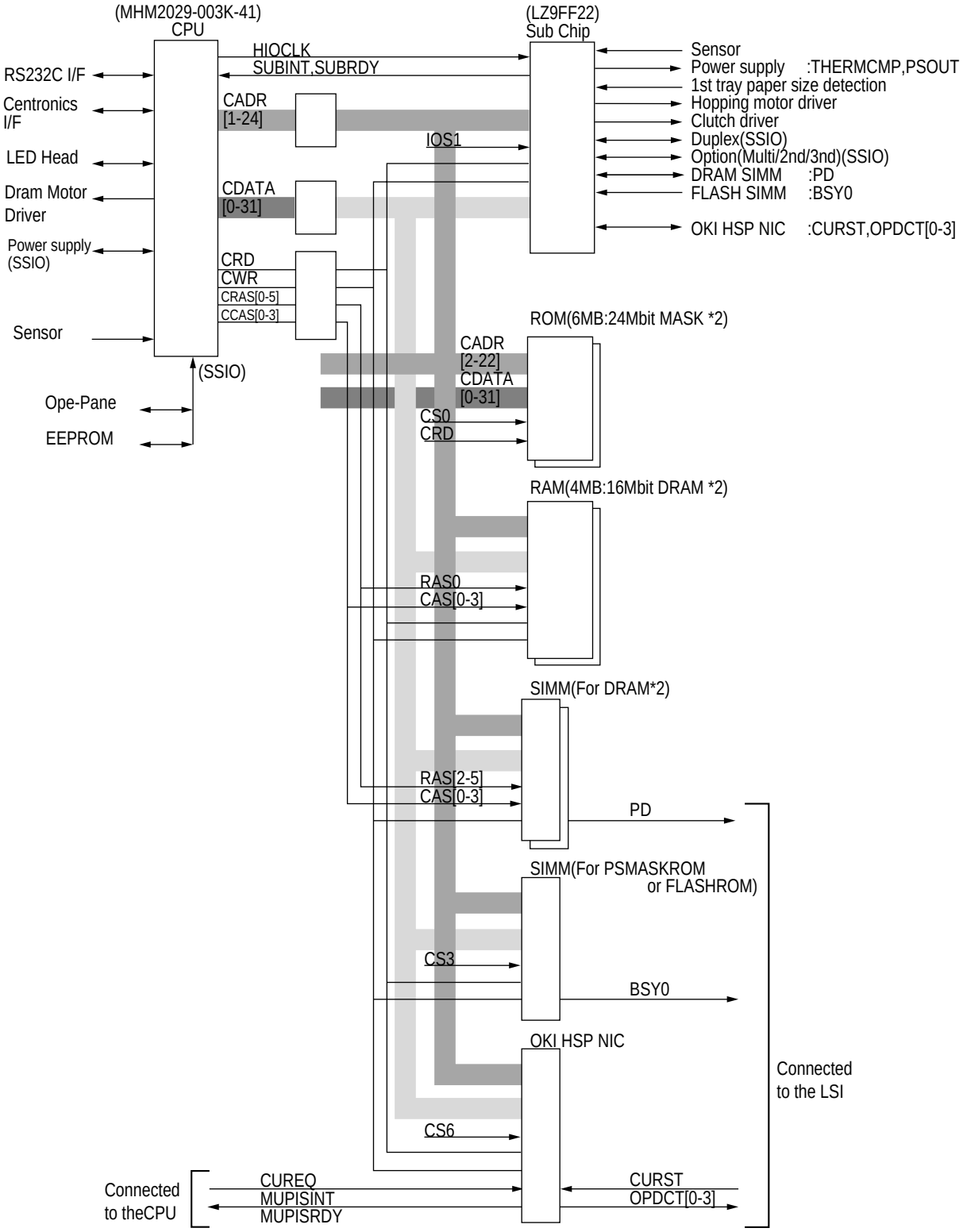
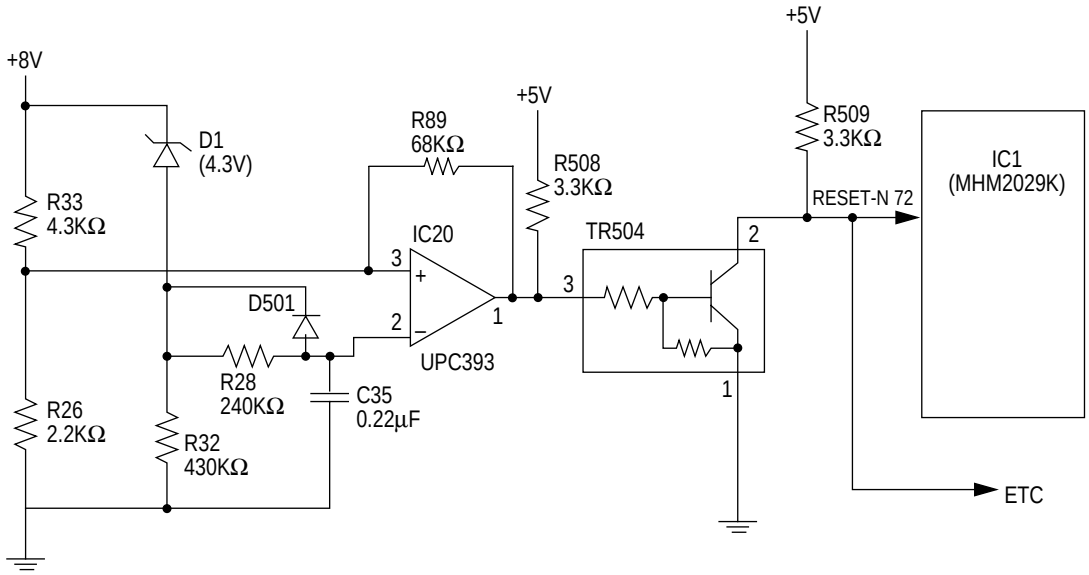
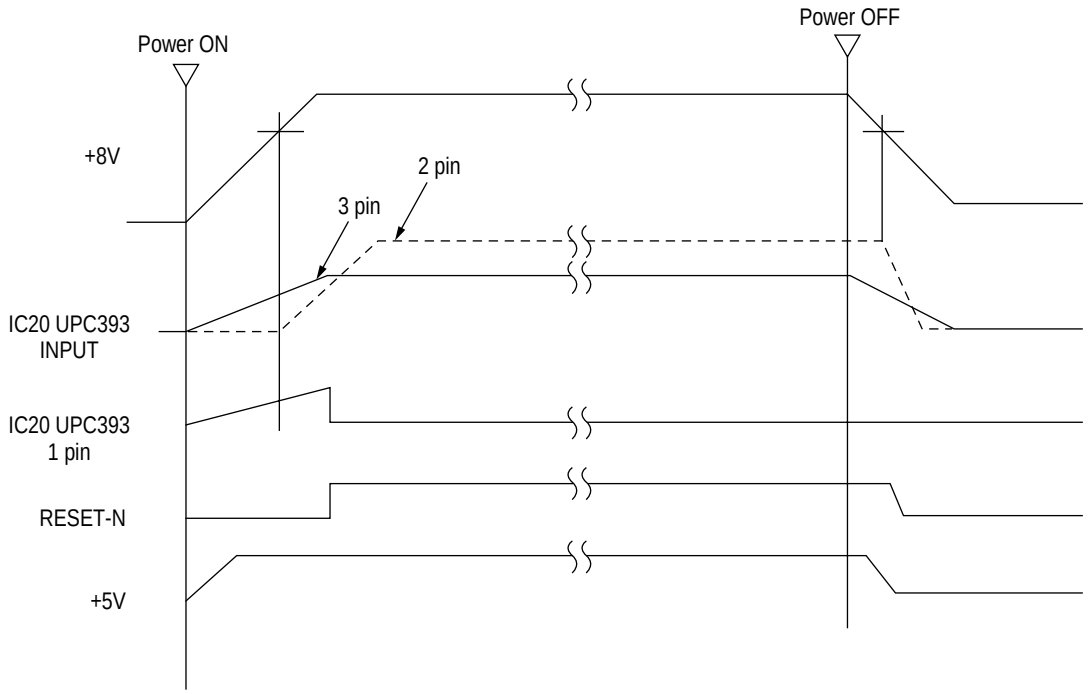


Figure 3-2 Block Diagram of CPU & Memory

3.3 Reset Control

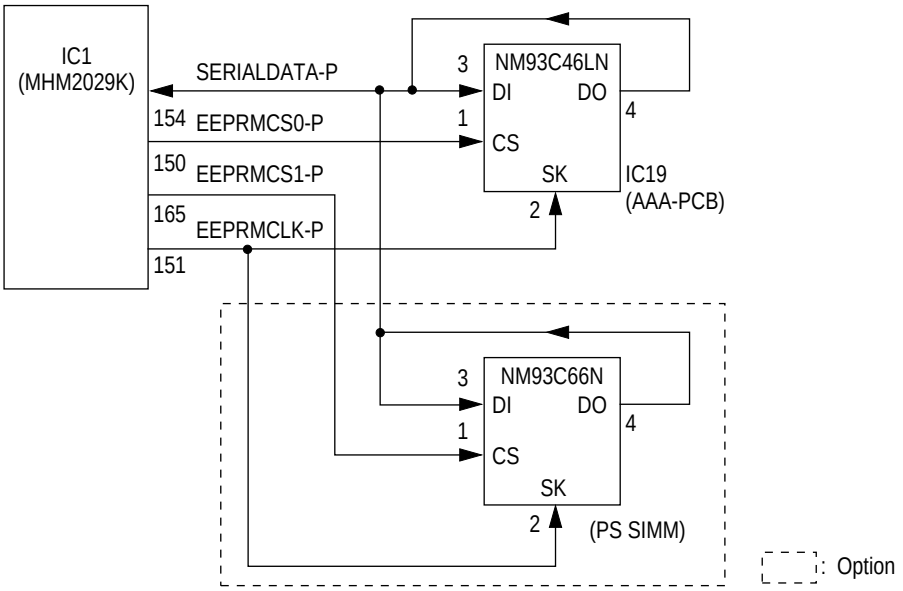
When power is turned on, a RESET-N signal is generated by the rising sequence of +8V power supply.





3.4 EEPROM Control

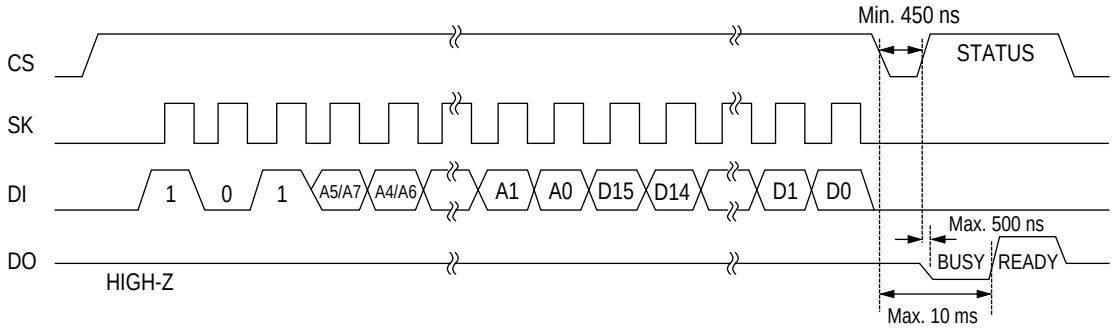
The NM93C46LN is an electrical erasable/programmable ROM of 64-bit x 16-bit configuration and the NM93C66N is an electrical erasable/programmable ROM of 256-bit x 16-bit configuration. Data input to and output from the ROM are bidirectionally transferred in units of 16 bits through a serial I/O port (SERIALDATA-P) in serial transmission synchronized with a clock signal from the CPU (IC1).



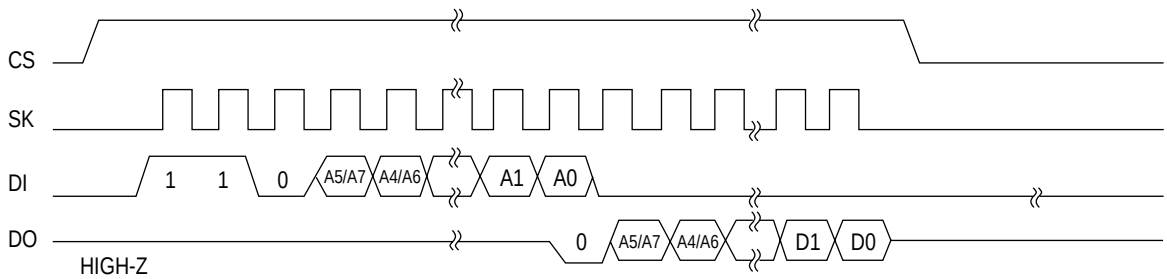
The EEPROM operates in the following instruction modes

Instruction	Start Bit	Operation Code	Address		Data
			NM93C46LN	NM93C66N	
Read (READ)	1	10	A5 to A0	A7 to A0	
Write Enabled (WEN)	1	00	11XXXX	11XXXXXX	
Write (WRITE)	1	01	A5 to A0	A7 to A0	D15 to D0
Write All Address (WRAL)	1	00	01XXXX	01XXXXXX	D15 to D0
Write Disabled (WDS)	1	00	00XXXX	00XXXXXX	
Erase	1	11	A5 to A0	A7 to A0	
Chip Erasable (ERAL)	1	00	10XXXX	10XXXXXX	

Write cycle timing (WRITE)

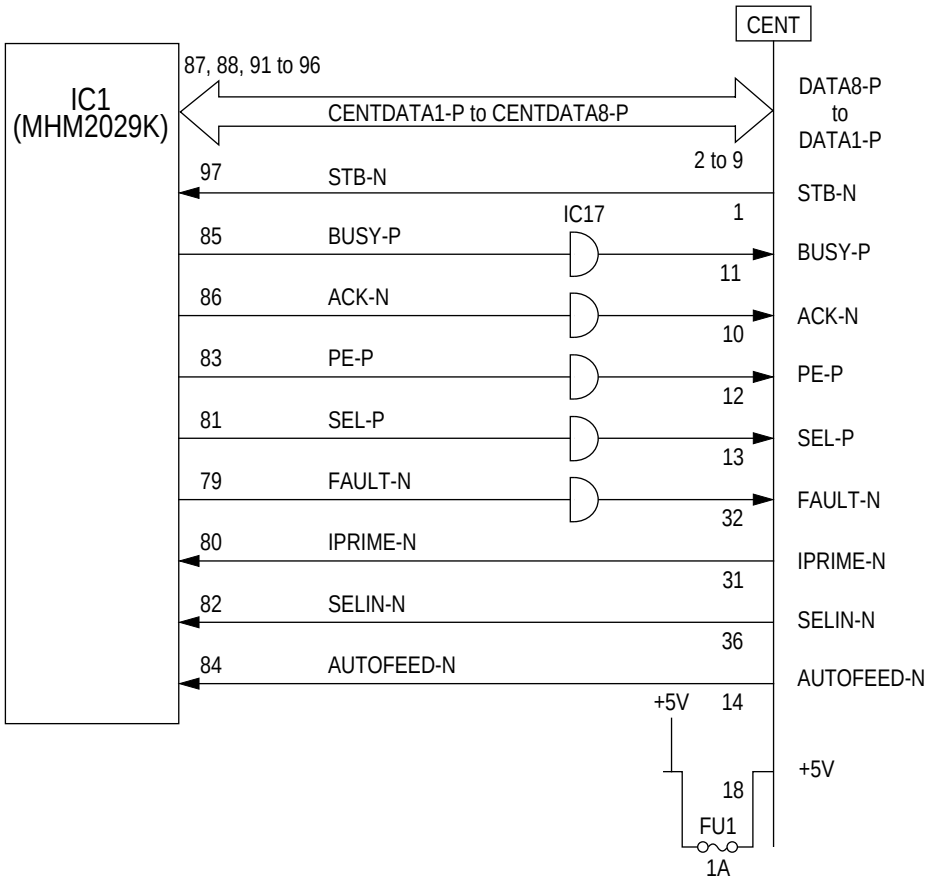


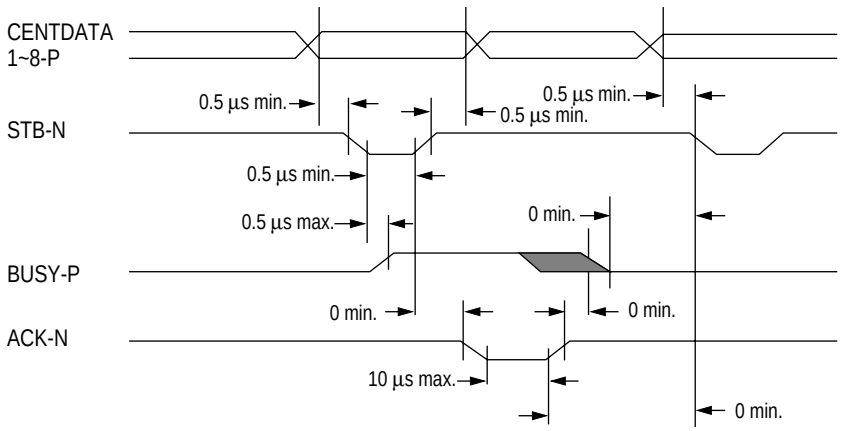
Read cycle timing (READ)



3.5 Centronics Parallel Interface

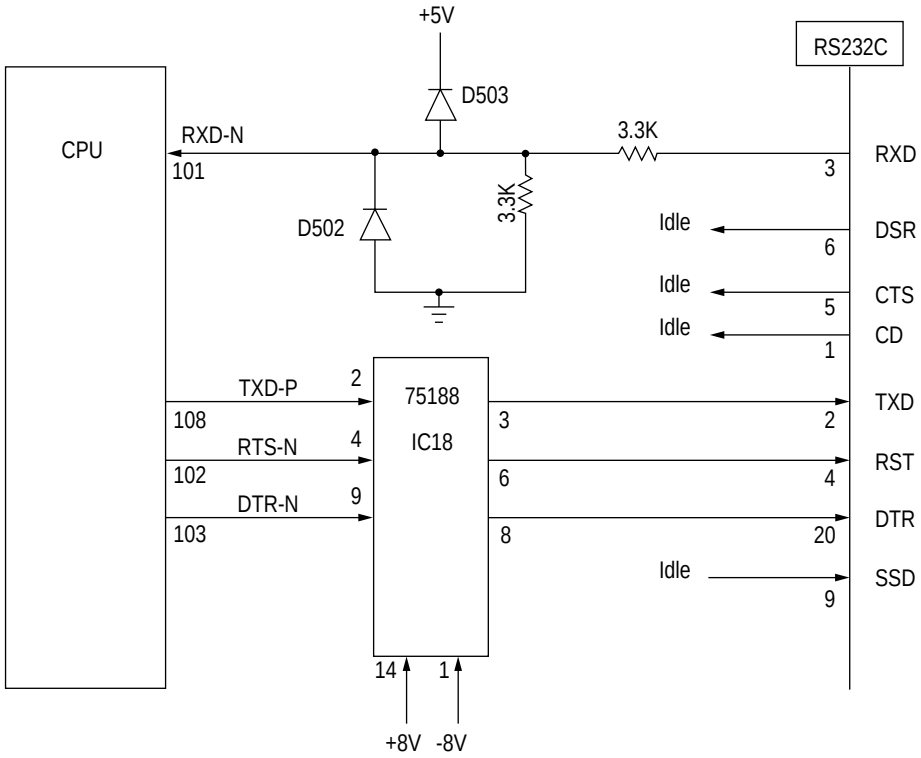
The CPU (IC1) sets a BUSY-P signal to ON at the same time when it reads the parallel data (CENTDATA1-P to CENTDATA8-P) from the parallel port at the fall of STB-N signal. Furthermore, it makes the store processing of received data into a receive buffer terminate within a certain fixed time and outputs an ACK-N signal, setting the BUSY-P signal to OFF.



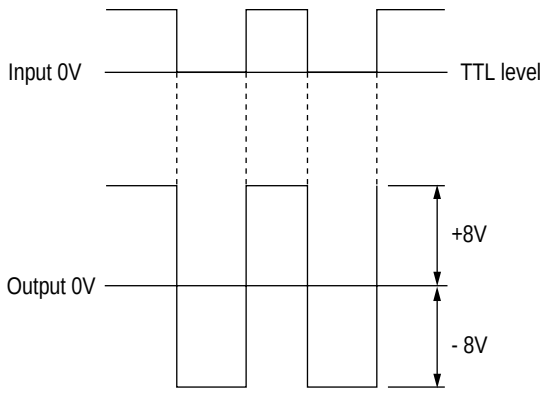


3.6 RS232C Interface

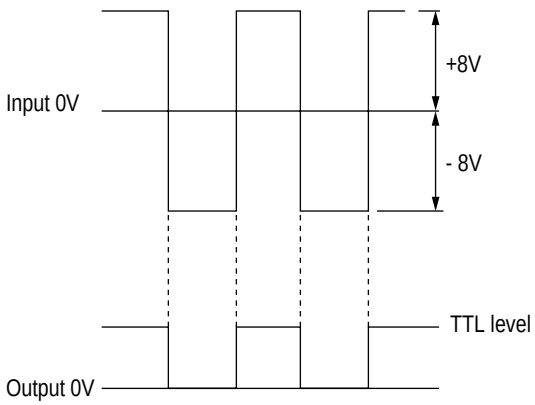
The serial data RXD from the host system, whose line voltage is clamped at the TTL level by D502/ D503, are received by the CPU built-in serial controller.
DSR, CTS and CD are not connected. Send signals TXD, RTS and DTR are put out from the CPU and are sent to lines through a line driver IC (75188).



(1) Send signal level

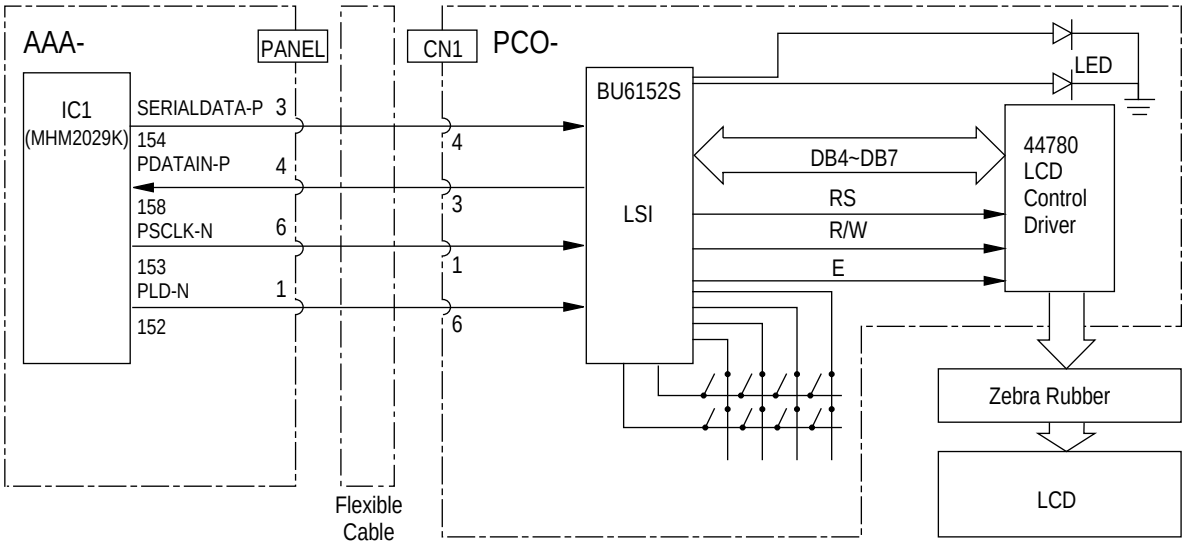


(2) Receive signal level



3.7 Operator Panel Control

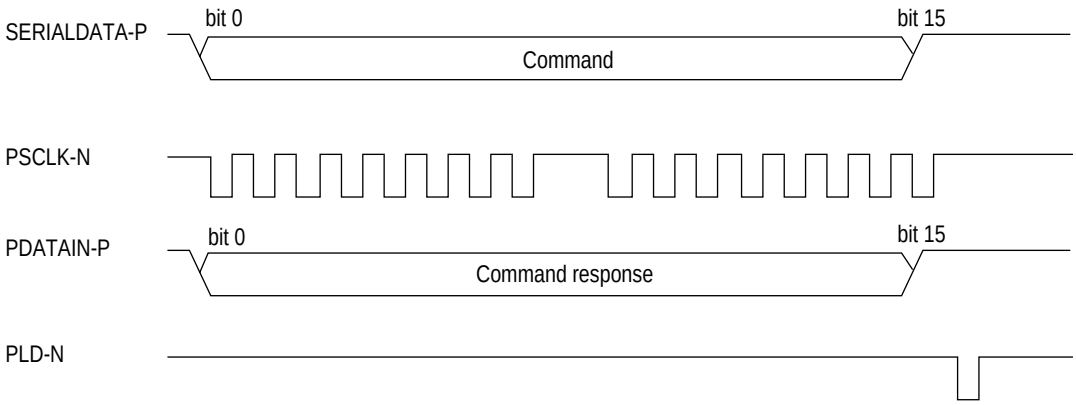
The operator panel consists of the following circuits.



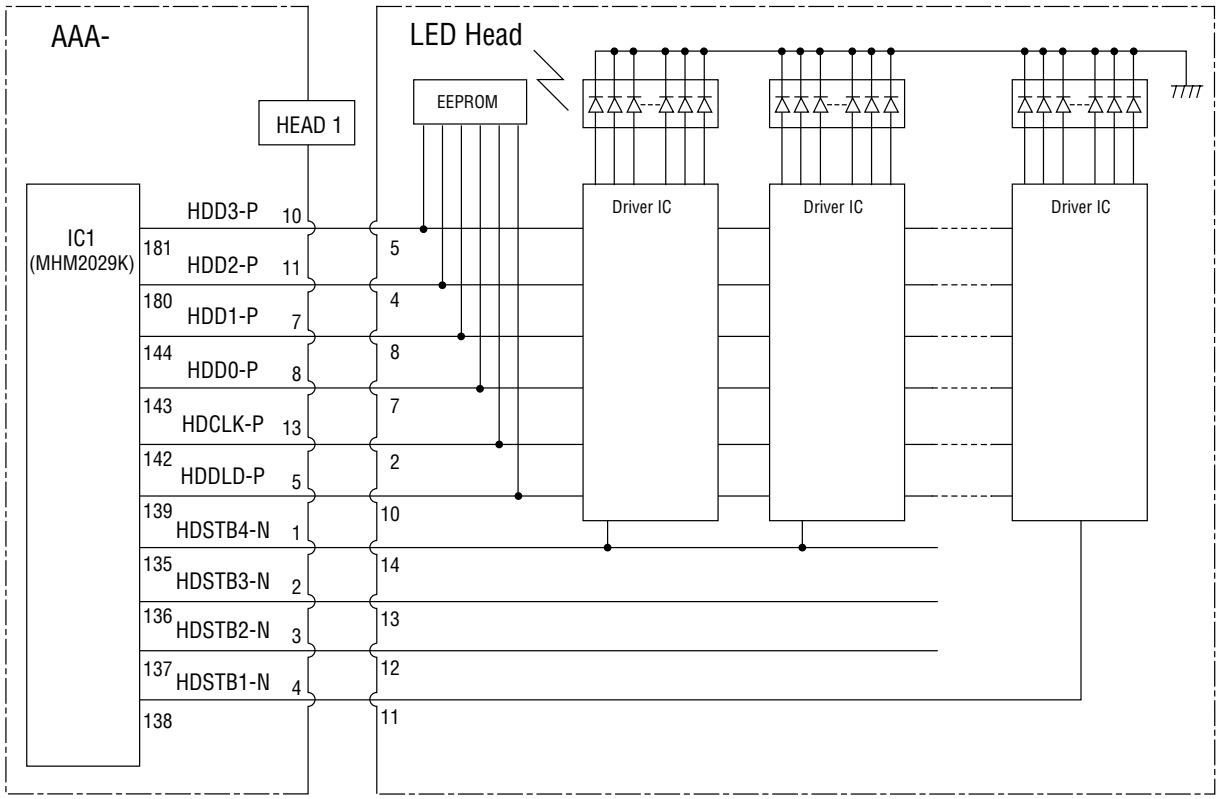
(1) BU6152S (LSI)

This LSI is connected to a clock synchronous serial port of the CPU (IC1). It controls switch data input, LED data output and LCD data input/output according to the commands given by the CPU. The CPU sends the 2-byte (16-bit) command (SERIALDATA-P) together with the shift clock signal (PCLK-N) to the LSI and then makes a predetermined input/output control if the command decoded by the LSI is found to be a normal command.

On receiving a command sent from the CPU, the LSI, synchronizing with the serial clock of the command, returns a 2-byte command response to the CPU.



3.8 LED Head Control

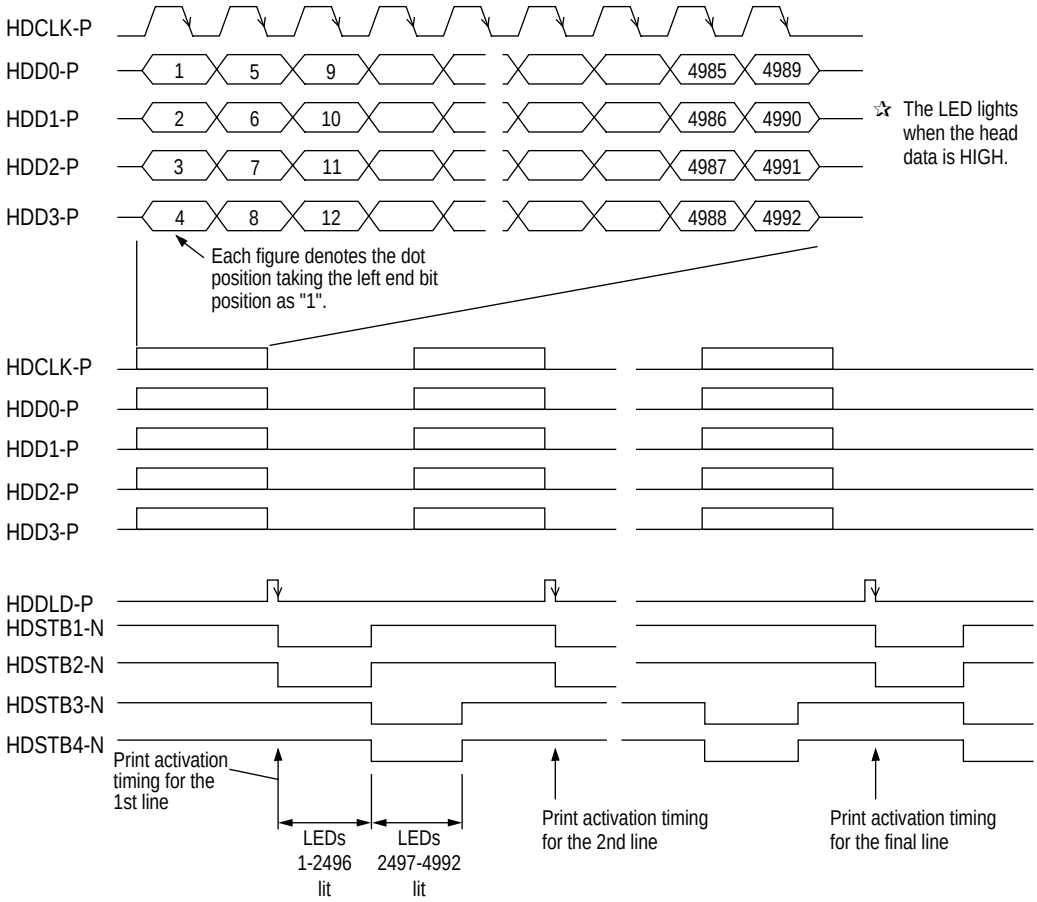


Data is transferred to the head unit starting with the data at the left end of the paper in the synchronous serial transfer mode using the HDCLK-P signal as the sync signal.

The total number of LEDs in the head unit is 4992. The data for the driver latches causes the corresponding LEDs to light only during the time when the HDSTBn-N signal is output. There are four HDSTBn-N signals (HDSTB1-N, HDSTB2-N, HDSTB3-N, and HDSTB4-N), each of which controls the corresponding driver for 1248 LEDs (4992/4).

The four HDSTBn-N signals must be output within the time when the LEDs for one line continue to emit light. After the data is moved to the latches by the HDSTBn-N signal, the transfer of the data of the next line can be started.

The timing chart for the outline of this operation is shown below.

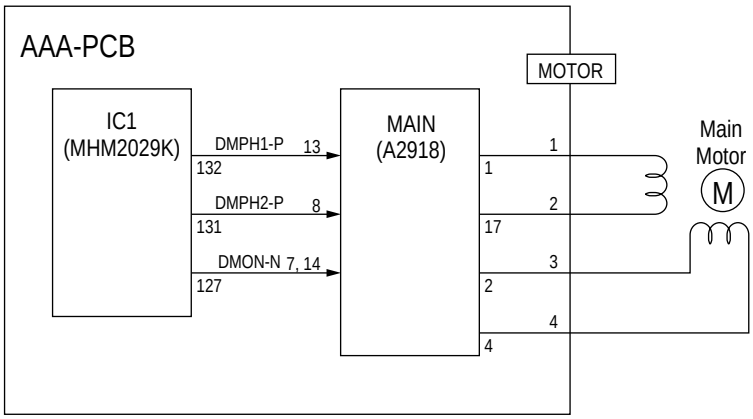


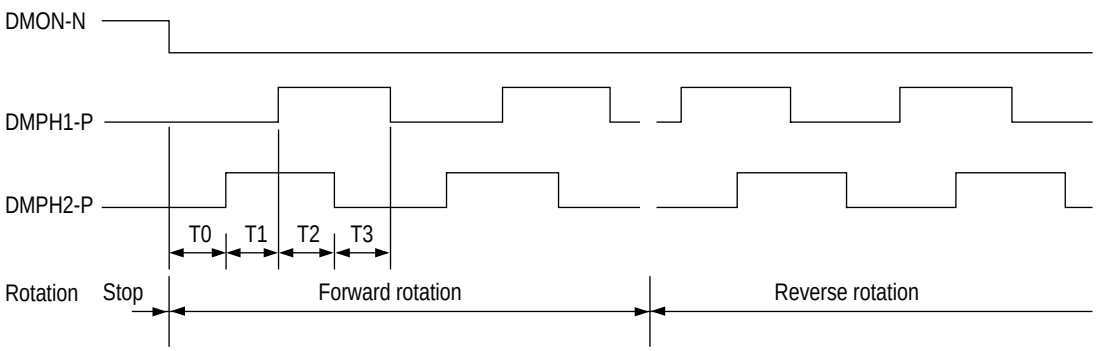
3.9 Motor Control

OKIPAGE20 controls the paper flow by two motors (main motor & hopping motor) and two clutches (clutch for feeding roller and clutch for regist roller).

(1) Main motor

The main motor is driven by the driver IC according to the control signal from the CPU (IC1: MHM2029K).

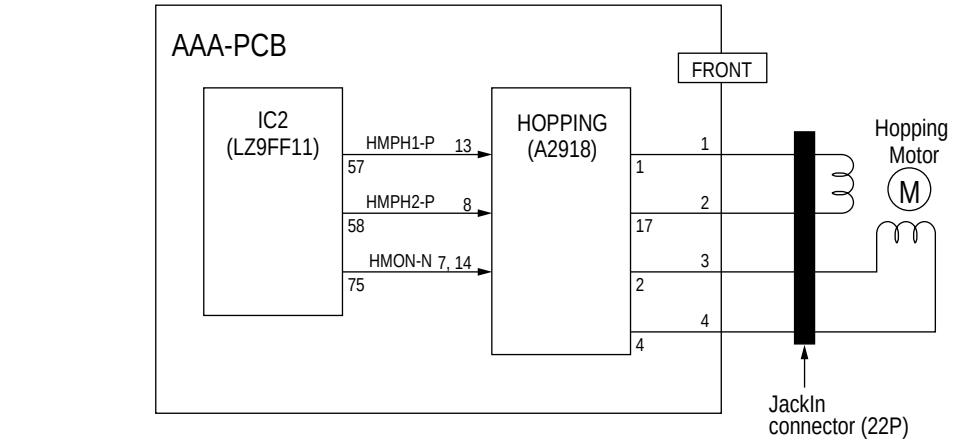


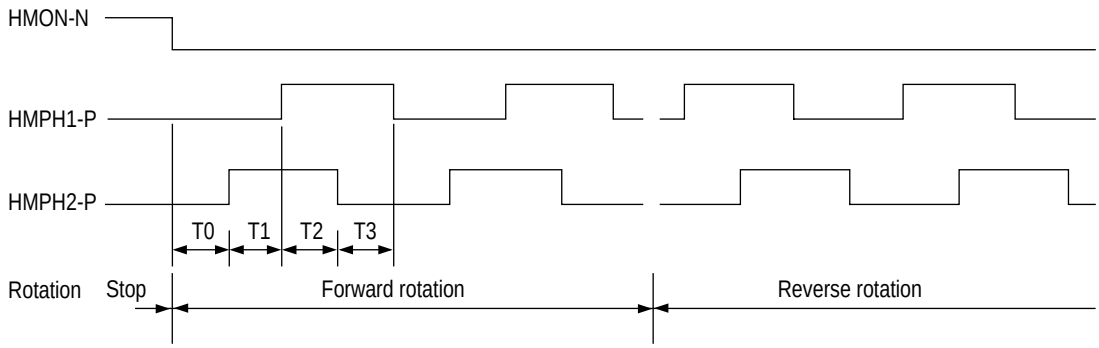


Operation at normal speed: T0 to T3 = 703 µs

(2) Hopping motor

The hopping motor is driven by the driver IC according to the control signal from the LSI (IC2: LZ9FF22).

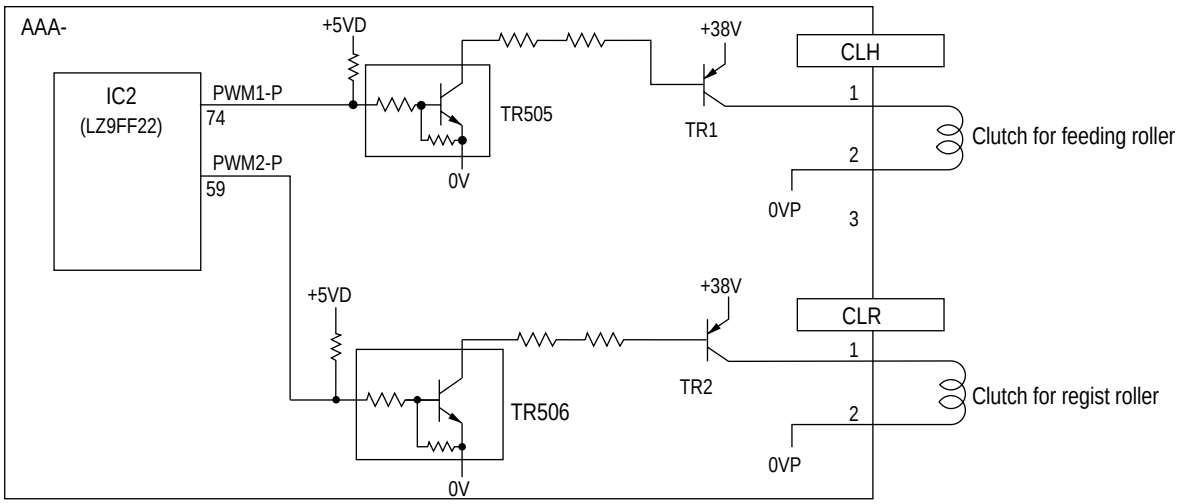




Operation at normal speed: T0 to T3 = 918 μs

(3) Clutch for feeding roller and clutch for regist roller

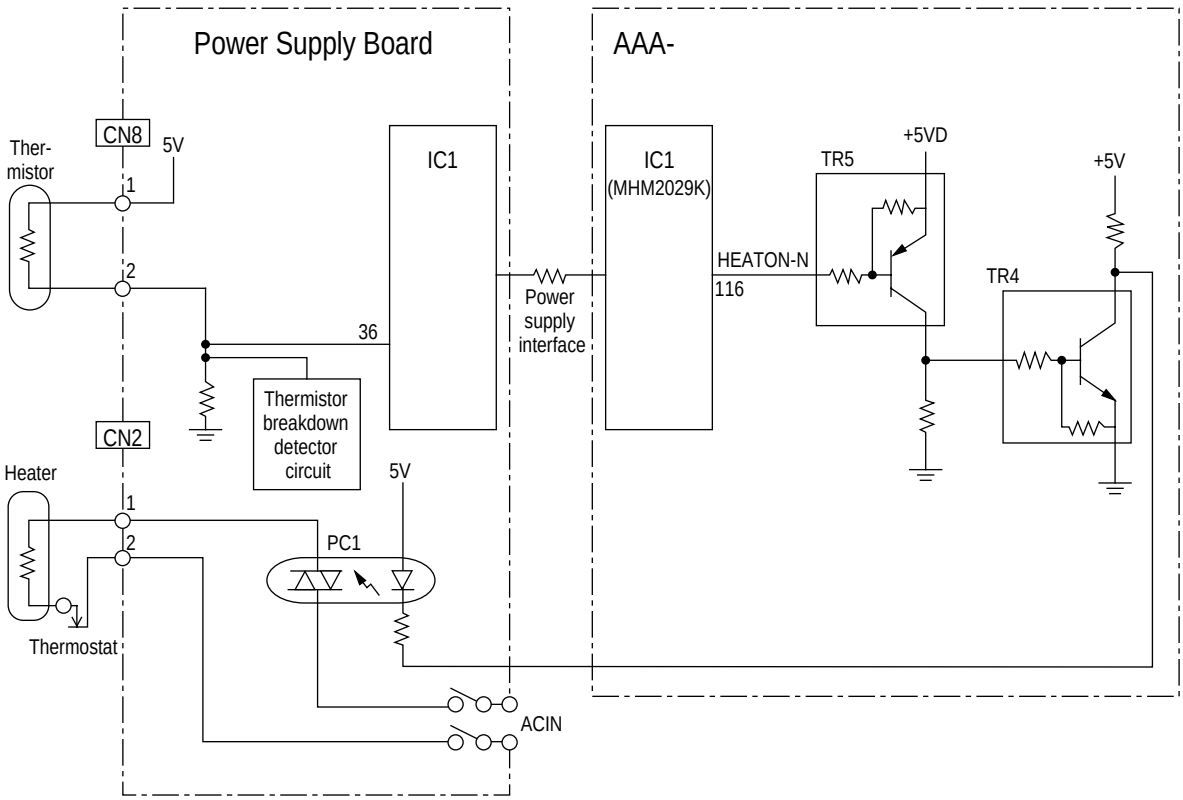
Clutch for feeding roller and clutch for regist roller are driven by the driver IC according to the control signal from the LSI (IC2: LZ9FF22).



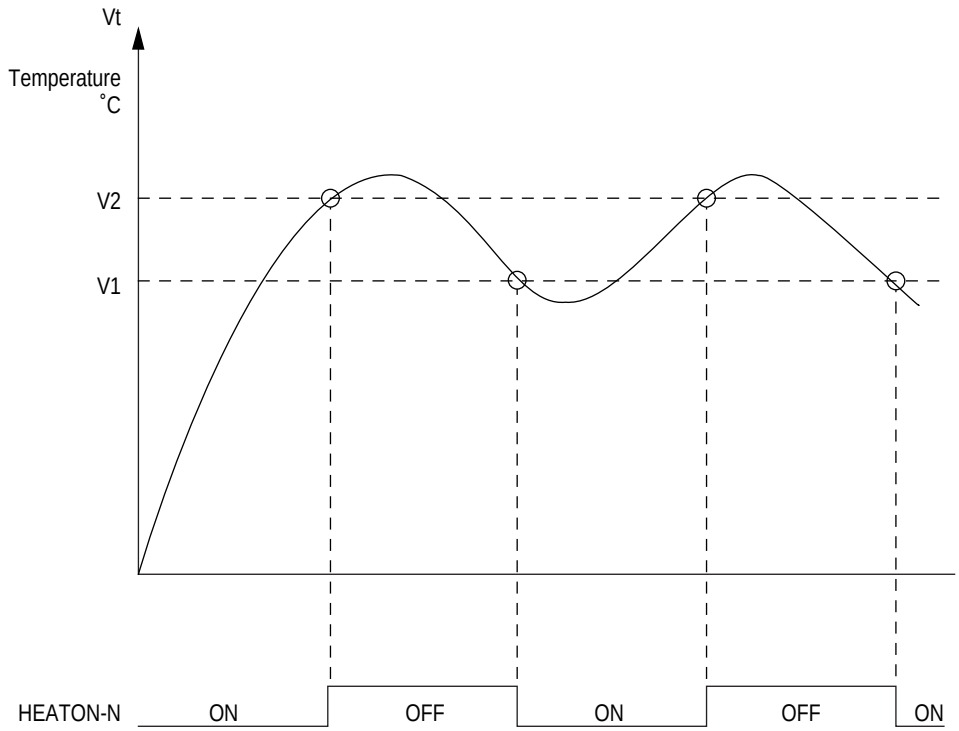
3.10 Fuser Temperature Control

For the temperature control by heater control, the variation in the resistance of the thermistor is A/D converted in and the resultant digital value is read and transferred to the CPU. The CPU turns on or off the HEATON-N signal according the value of the signal received from to keep the temperature constant.

Immediately after the power is turned on, the thermistor is checked for shortcircuit and breakdown. If the thermistor is shorted, the A/D converted value shows an extremely high temperature, so that the shortcircuit can be detected. If the breakdown of the thermistor occurs, the A/D converted value shows the normal temperature. In this case, the thermistor breakdown can be detected by the sequence shown at the end of this section. If the heater is overheated, 5V supply is turned off by detecting that the resistance of the thermistor exceeds the predetermined value.



The temperature control is described below.



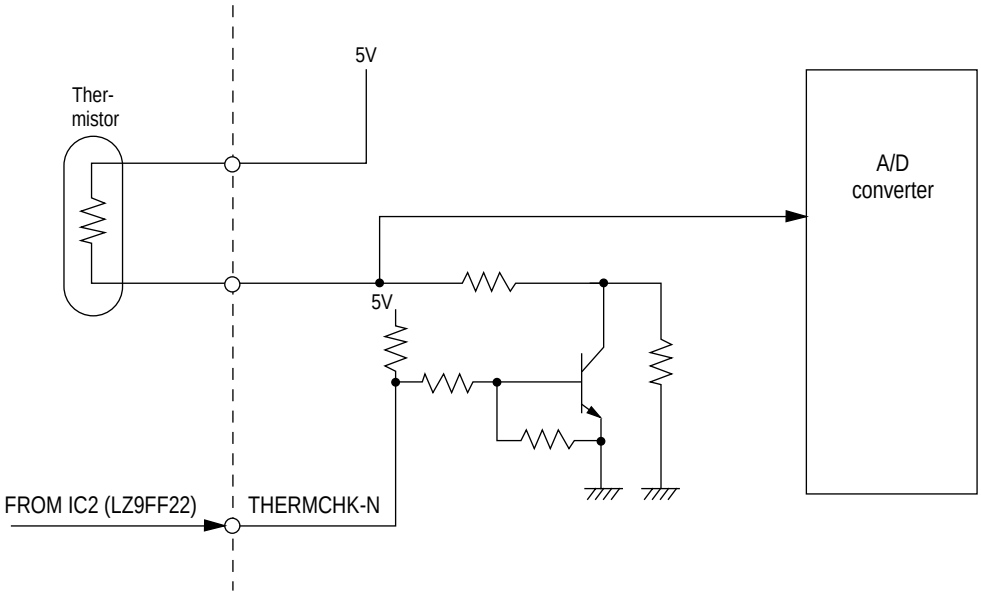
V2	192˚C
V1	169˚C

* The values V1 and V2 vary according to setting mode.

(Standard paper : MEDIA TYPE = MEDIUM)

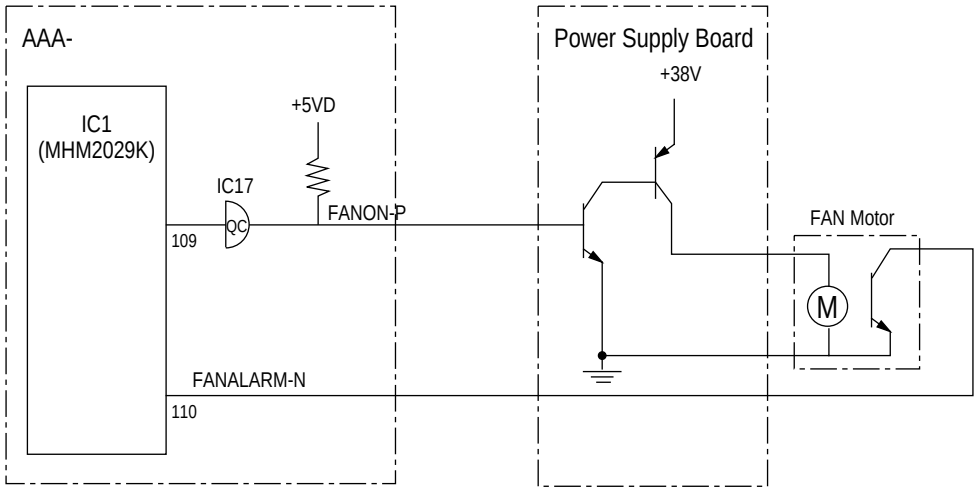
When Vt rises to V2 or more, the heater is turned off (by setting HEATON-N signal to HIGH). When Vt drops to V1 or less, the heater is turned on (by setting HEATON-N signal to LOW). In this way, the temperature can be kept within the predetermined range.

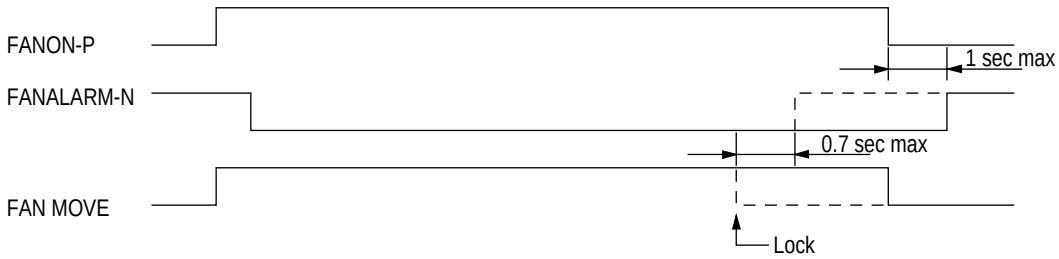
To detect the breakdown of the heater, the heater is turned on. If the corresponding temperature rise is not detected, it is judged that heater breakdown occurs. To shorten the breakdown detecting time, the following circuit is used. When the thermistor is checked for breakdown immediately after the power is turned on, the THERMCHK-N signal is turned on to turn transistor Q5 off. As a result, the thermistor serial resistance is varied to increase the reading resolution.



3.11 Fan Motor Control

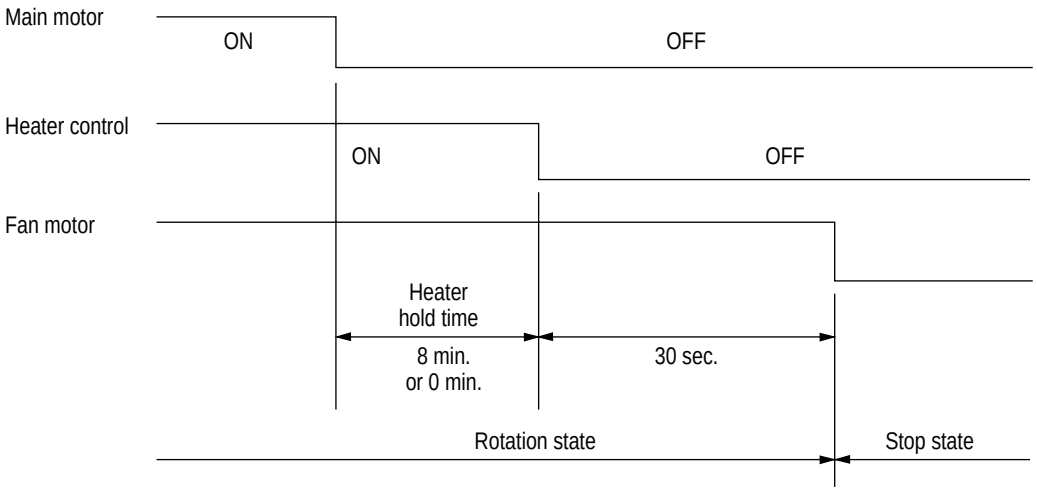
The stop/rotation of the fan motor is controlled by a FANON-P signal. When the fan motor rotates normally, a FANALM-N signal generated in the hole element built in the fan motor is input to the CPU.





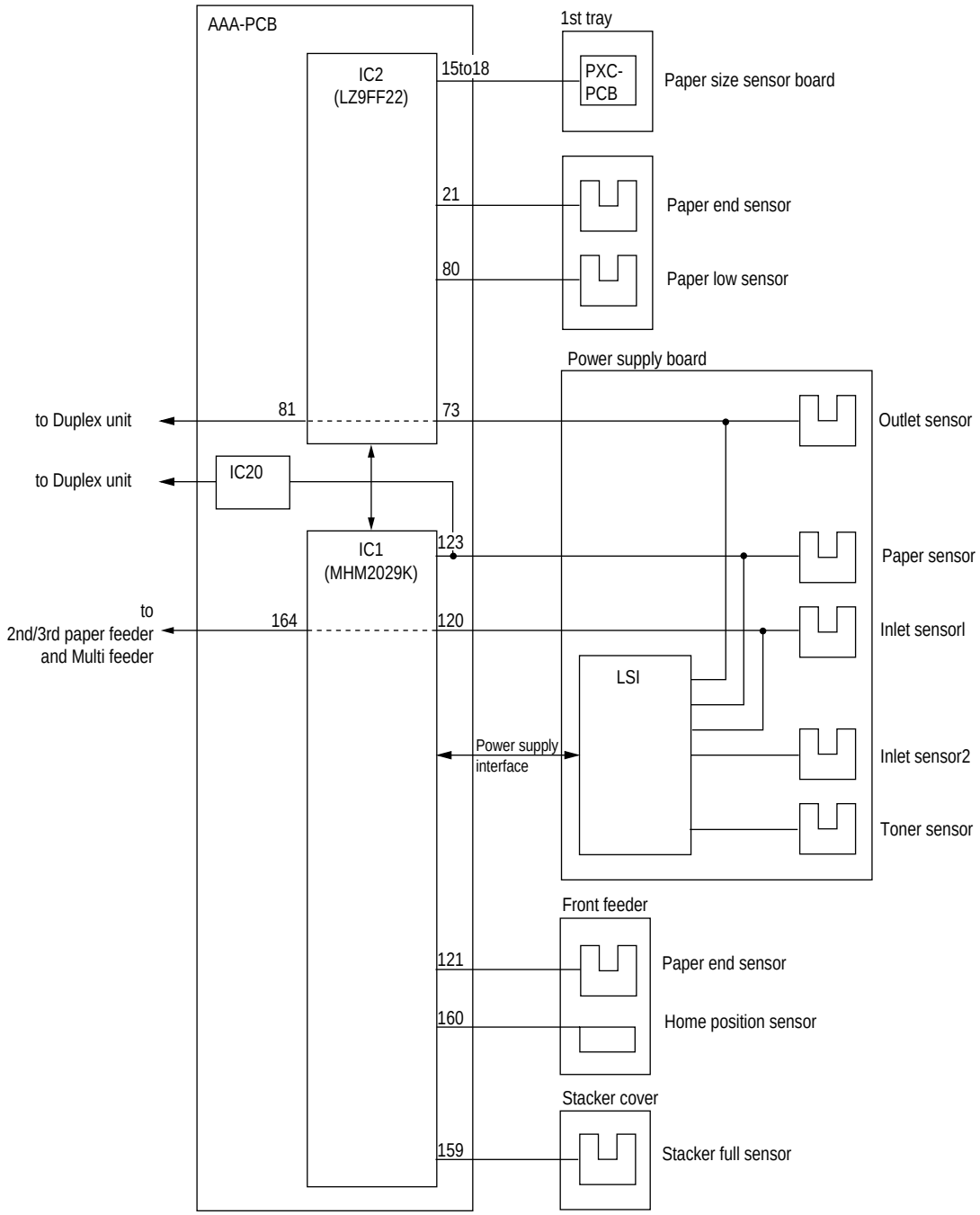
Fan motor start: Initial request, heater on, print start request

Fan motor stop:
- The motor immediately stops when an engine error or a fan error occurs.
- The motor stops 30 seconds after the occurrence of a paper jam, size error, or fuse error.
- The motor stops in the power save mode as below.



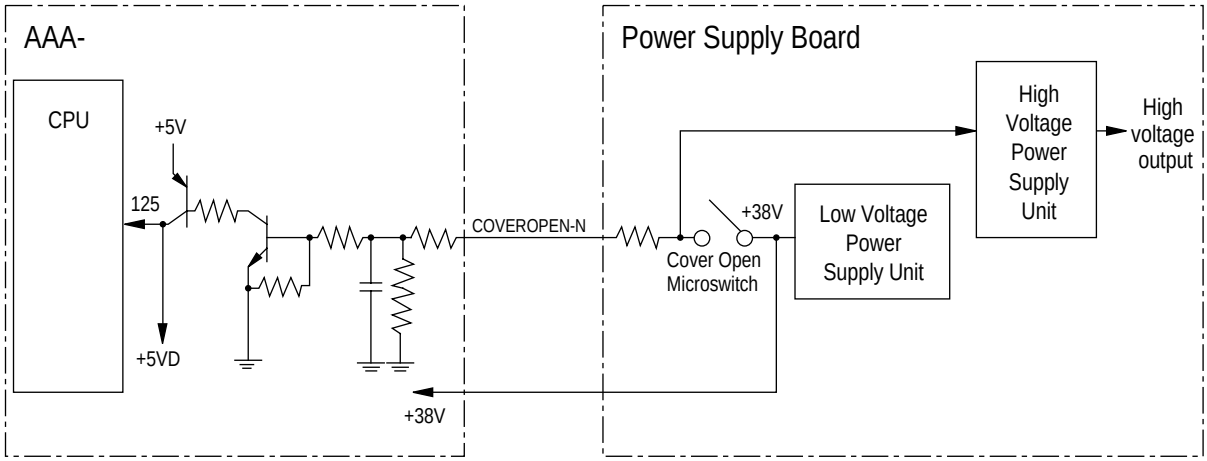
3.12 Sensor Supervision

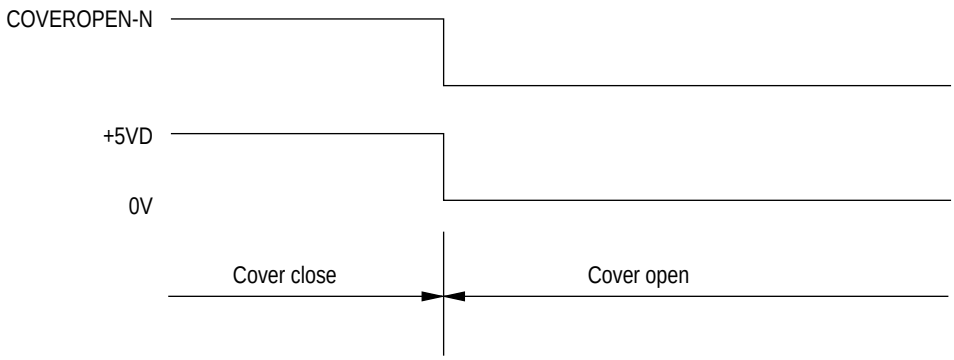
OKIPAGE20 unit is provided with 11 sensors.
The signals of Toner sensor and Inlet sensor 2 among these sensors are read through the Power supply interface.
Other sensor signals are read directly from the input ports of CPU (IC1: MHM2029K) and LSI (IC2: LZ9FF22).
Also, regarding Inlet sensor 1 signal, Paper sensor signal and Outlet sensor signal, their changed status can be notified as a CPU interruption.
In addition, these three signals can be read through the Power supply interface.



3.13 Cover Open

When the cover is opened, a cover open microswitch is opened. This makes a XCOVEROPEN-N signal low, then off the +5VD, thereby the CPU detects the open state. Furthermore, opening the cover stops applying a +38V power to the high voltage power supply unit, resulting in stopping all high voltage outputs.



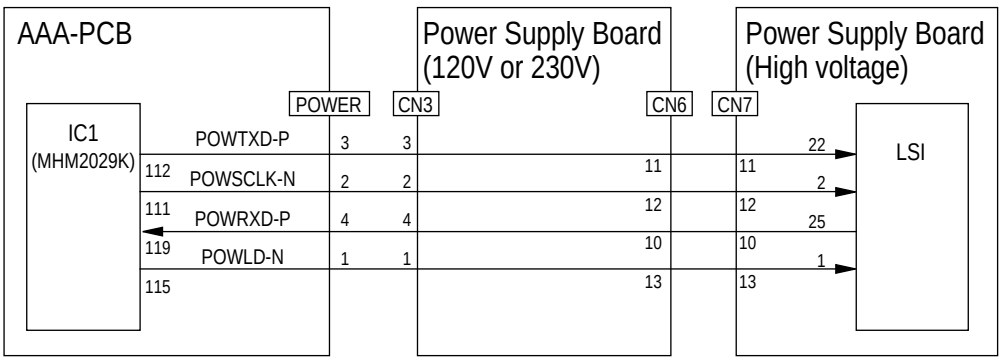


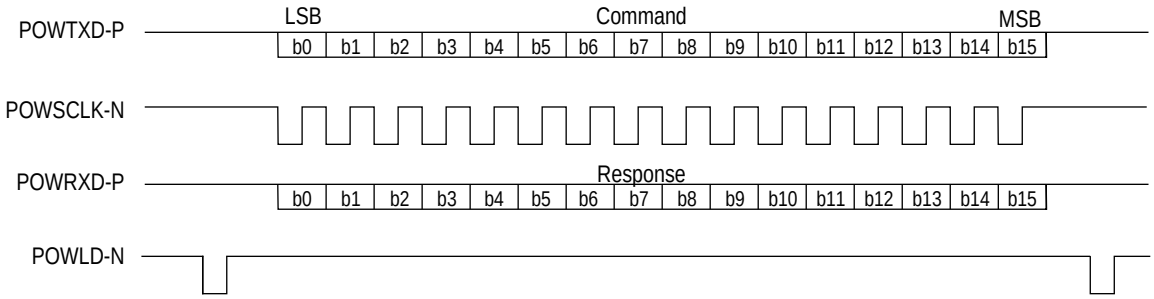
3.14 Power Supply Interface

The power supply interface is a 16 bit clock synchronous serial interface between the synchronous serial I/O ports of CPU (IC1: MHM2029K) and the power control LSI in the power supply board (High voltage) under the control of the CPU (IC1: MHM2029K).

When the control section transmits a command on POWTXD-P signal in synchronization with the clock (POWSCLK-N) to the power supply board, this power supply board transmits a response on POWRXD-P signal in synchronization with the same clock to the control section.

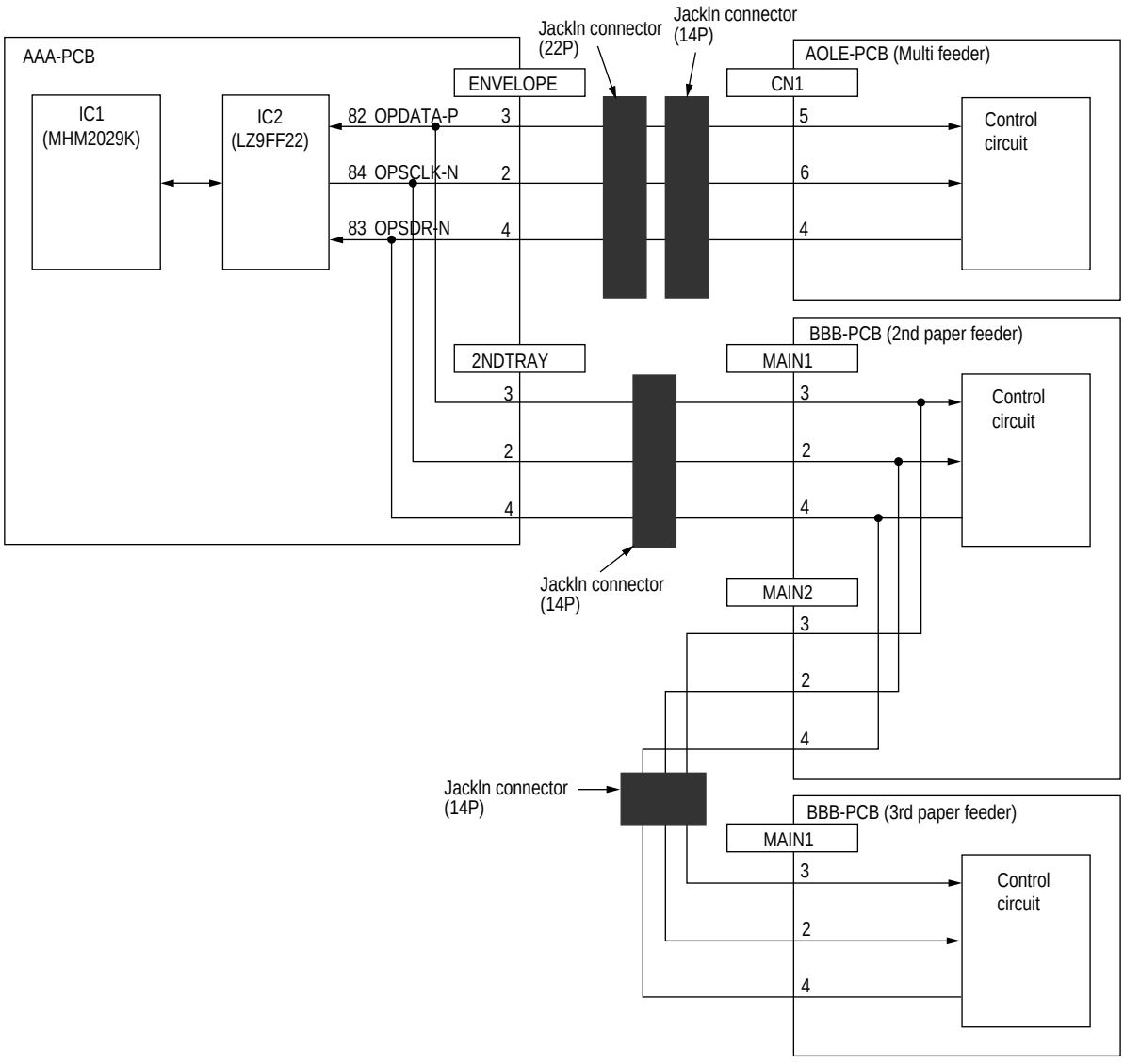
The commands include the control data of the high-voltage power supply, etc.
The responses include sensor information, fuser unit temperature information, etc.

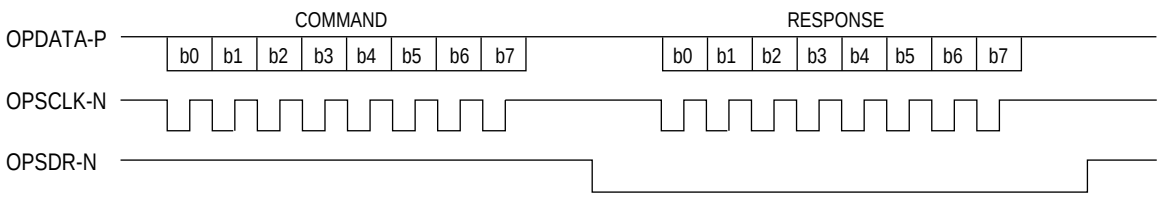



POWTXD-P
LSB
Command
MSB
b0 b1 b2 b3 b4 b5 b6 b7 b8 b9 b10 b11 b12 b13 b14 b15
POWSCLK-N
POWRXD-P
Response
b0 b1 b2 b3 b4 b5 b6 b7 b8 b9 b10 b11 b12 b13 b14 b15
POWLD-N

3.15 Option (2nd/3rd paper feeder and Multi feeder) Interface

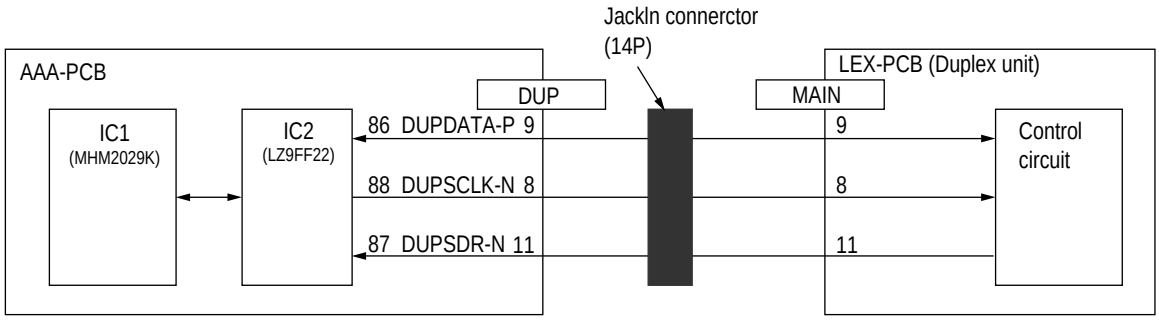
The option interface is a 8 bit clock synchronous serial interface between the synchronous serial I/O ports of LSI (IC2: LZ9FF22) and 4 bit micro-controllers in the option control boards under the control of the CPU (IC1: MHM2029K).
First the control section transmits a command on OPDATA-P signal in synchronization with the clock (OPSCLK-N) to the option.
The option which receives the command will analyze it and assert OPSDR-N signal after becoming a ready state for returning a response. When the control section recognizes the OPSDR signal asserted, it will output a clock signal only at this time.
The option will output a response on the OPDATA-P signal line in synchronization with this clock signal (OPSCK-N).
The commands include the control data, etc.
The responses include sensor information, etc.

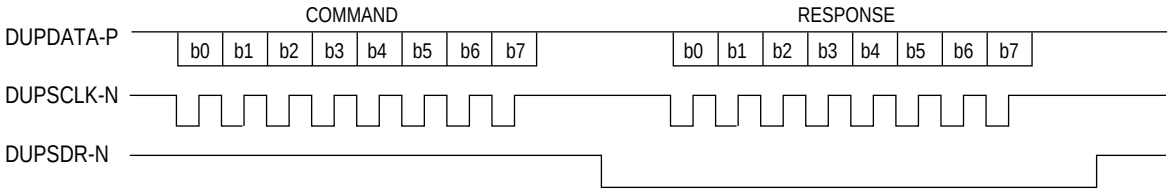




3.16 DUPLEX Interface

The Duplex interface is a 8 bit clock synchronous serial interface between the synchronous serial I/O ports of LSI (IC2: LZ9FF22) and 8 bit micro-controllers in the option control boards under the control of the CPU (IC1: MHM2029K).
First the control section transmits a command on DUPDATA-P signal in synchronization with the clock (DUPSCLK-N) to the Duplex unit.
The Duplex unit which receives the command will analyze it and assert OPSDR-N signal after becoming a ready state for returning a response. When the control section recognizes the OPSDR signal asserted, it will output a clock signal only at this time.
The Duplex unit will output a response on the OPDATA-P signal line in synchronization with this clock signal (OPSCK-N).
The commands include the control data, etc.
The responses include sensor information, etc.

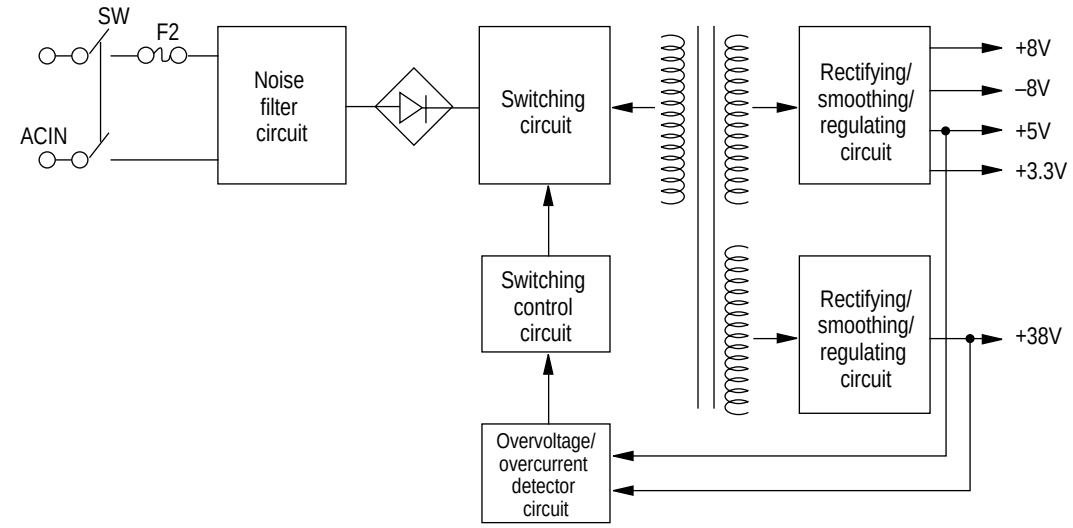


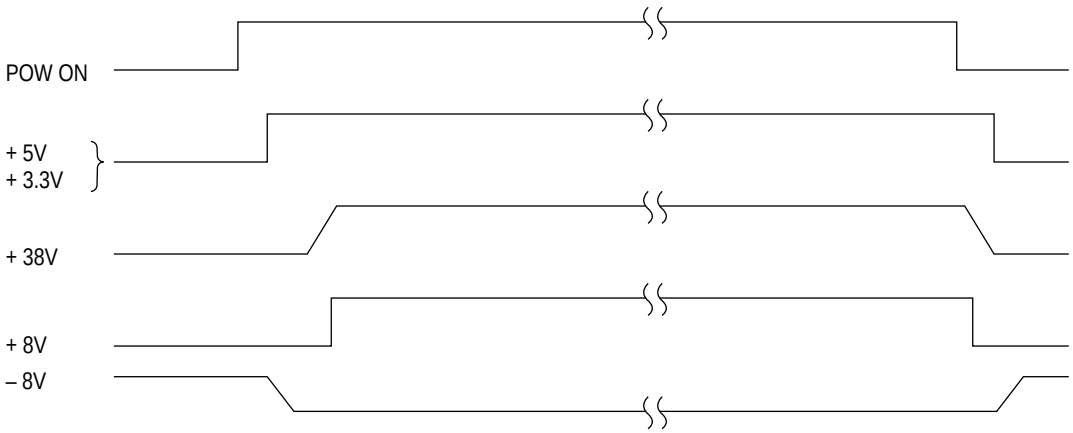


3.17 Power Supply Board

The power supply circuit consists of the low-voltage power supply circuit and the high-voltage power supply circuit. The low-voltage power supply circuit adopts a switching power supply system and provides DC voltages required for the control of the equipment. The high-voltage power supply circuit receives +38V power from the low-voltage power supply circuit and provides various high voltages required for the electrophotographic process according to the control signals from the control section.

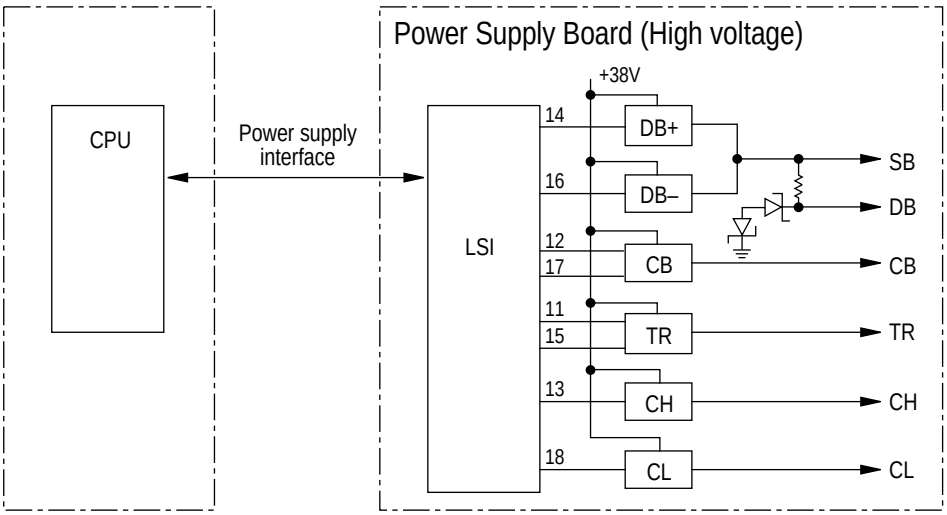
(1) Low-voltage power supply circuit





(2) High-voltage power supply circuit

This high-voltage power supply circuit receives the high-voltage generation timing control command that is transmitted in serial through the power supply interface from the control section. It decodes this command by LSI (IC1) and outputs high-frequency pulses to the corresponding high-voltage generating circuits through pins 12, 13, 14, 15, 16, 17 and 18 of LSI (IC1). It supplies +38V to each high-voltage generating circuit as the source voltage. When the cover is open, the supply of +38V is interrupted to interrupt all the high-voltage outputs. The relationship between the high-frequency pulse output pins and the high-voltage outputs is shown in the following table.



High-voltage outputs / High-frequency pulse output pins	SB	DB	CB	TR	CH	CL
11				CC : 0~20μA CV : 0~5KV		
12			+450V			
13					-1.3KV	
14	0V	+300V				
15				-1.3KV		
16	-450V	-220V				
17			-1.35KV			
18						CC : -15μA

CC : Constant Current
CV : Constant Voltage

Part with slant line: no output

4. TROUBLESHOOTING

4.1 Troubleshooting Table

(A) Power/sensor board

Note: The malfunction of the power supply is not repaired by an agency. The abnormality to be treated here is taht of sensors only.

Failure	LCD Message	Flowchart No.
A paper input jam occurs frequently.	PAPER INPUT JAM CHECK ******	A - 1
A paper feed jam occurs frequently.	PAPER FEED JAM CHECK ******	A - 2
A paper-exit jam occurs frequently.	PAPER EXIT JAM REMOVE THE PAPER	A - 3
A paper size error occurs frequently.	ERROR PAPER SIZE CHECK ******	A - 4
The message "COVER OPEN" remains displayed on the LCD.	COVER OPEN	A - 5
The message "TONER LOW" remains displayed on the LCD.	TONER LOW	A - 6
The message "TONER SENSOR" remains displayed on the LCD.	TONER SENSOR	A - 7
A toner sensor error occurs frequently.	ERROR 77	A - 7
A thermistor open error occurs frequently.	ERROR 72	A - 8
A thermistor short error occurs frequently.	ERROR 73	A - 9

(B) Main control board (AAA-) (1/3)

Failure	LCD Message	Flowchart No.
Abnormal message display on the LCD (no display, unclear display, display with some dot not lit).		B - 1
Program ROM error	ERROR 10	B - 2
Resident RAM error	ERROR 30	B - 3
EEPROM error	ERROR 40	B - 4
Option ROM error	ERROR 50	B - 5
Flash SIMM error	ERROR 51	B - 6
Option RAM error	ERROR 60	B - 7
Cooling fan error	ERROR 70	B - 8
Thermistor open error	ERROR 72	B - 9
SSIO error	ERROR 74	B - 10
Opepanel I/F time out error	ERROR 80	B - 11
Option tray I/F timeout error	ERROR 81	B - 12
Duplex I/F timeout error	ERROR 83	B - 13

(B) Main control board (AAA-) (2/3)

Failure	LCD Message	Flowchart No.
Watchdog timer timeout	ERROR 90	B - 14
Program error	ERROR F*	B - 15
Processor error	ERROR CONTROLLER 0*	B - 16
Cover open occurs frequently	COVER OPEN	B - 17
Paper input JAM occurs	PAPER INUT JAM CHECK *****	B -18
Paper feed JAM occurs	PAPER FEED JAM CHECK *****	B - 19
DUPLEX input JAM occurs	DUPLEX INPUT JAM REMOVE THE PAPER	B - 20
DUPLEX feed JAM1 occurs	DUPLEX FEED JAM1 REMOVE THE PAPER	B - 21
Paper size error occurs	ERROR PAPER SIZE CHECK *****	B - 22
The message "STACKER FULL REMOVE THE PAPER" remains displayed on the LCD	STACKER FULL REMOVE THE PAPER	B - 23
The message "PAPER OUT ******** TRAY1" remains displayed on the LCD	PAPER OUT ******** TRAY1	B - 24
The message "PAPER NEAREND T1" remains displayed on the LCD	 PAPER NEAREND T1	B - 25
The message "TONER SENSOR" remains displayed on the LCD	 TONER SENSOR	B - 26

(B) Main control board (AAA-) (3/3)

Failure	LCD Message	Flowchart No.
Data sent through the centronics I/F cannot be received		B - 27
Data sent through the RS232C I/F cannot be received		B - 28

(C) Operator panel board (PCO-)

Failure	LCD Message	Flowchart No.
Abnormal message display on the LCD (no display, display with some dot not lt, etc.)		C - 1
The key switch operation on the operator panel is disabled.		C - 2

(D) Cassette switch board (PXC-)

Failure	LCD Message	Flowchart No.
Paper size error occurs	ERROR PAPER SIZE CHECK TRAY1	D - 1

4.2 Troubleshooting Flowchart

A-1 A paper input jam occurs frequently.

- Is PC3 (Inlet Sensor 1) operating normally?
  - No — Replace PC3.
- Yes — Is PC5 (Inlet Sensor 2) operating normally?
  - No — Replace PC5.
- Yes — Failure of IC1.

A-2 A paper feed jam occurs frequently.

- Is PC3 (Inlet Sensor 1) operating normally?
  - No — Replace PC3.
- Yes — Is PC5 (Inlet Sensor 2) operating normally?
  - No — Replace PC5.
- Yes — Is PC2 (Paper Sensor) operating normally?
  - No — Replace PC2.
- Yes — Is PC501 (Outlet Sensor) operating normally?
  - No — Replace PC501.
- Yes — Failure of IC1.

A-3 A Paper exit jam occurs frequently.

- Is PC501 (Outlet Sensor) operating normally?
  - No — Replace PC501.
- Yes — Failure of IC1.

A-4 A paper size error occurs frequently.

- Is PC3 (Inlet Sensor 1) operating normally?
  - No — Replace PC3.
- Yes — Is PC5 (Inlet Sensor 2) operating normally?
  - No — Replace PC5.
- Yes — Failure of IC1.

A-5 The message "COVER OPEN" remains displayed on the LCD.

- Replace Cover Open Switch.

A-6 The message "TONER LOW" remains displayed on the LCD.

- Is PC6 (Toner Sensor) operating normally?
  - No Replace PC6.
  - Yes Failure of IC1.

A-7 The message "TONER SENSOR" remains displayed on the LCD.
A toner sensor error occurs frequently.

- Is PC6 (Toner Sensor) operating normally?
  - No Replace PC6.
  - Yes Failure of IC1.

A-8 A thermistor OPEN error occurs frequently.

- Is the heater lamp lit?
  - No Failure of PC1 (photocoupler)
  - Yes Failure of IC1

A-9 A thermistor short error occurs frequently.

- Failure of IC1

B-1 Abnormal message display on the LCD.

- Replace IC5–IC8.
- OK?
- No — Is the 10.1376 MHz clock signal being put out to pin 1 of OSC1?
  - • No — Replace OSC1.
- Yes — Is the output at pin 3 (RESET-N) of TR504 (DTC114EK) normal? (Refer to [3.3 Reset Control] page 7.)
  - No — Replace TR504 (DTC114EK).
  - OK?
  - No — Replace IC20 (UPC393G2).
- Yes — Failure of IC1 (MHM2029K)

B-2 Program ROM error (ERROR10)

- Replace IC5–IC8.

B-3 Resident RAM error (ERROR 30)

- Are negative pulses being put out to Pin 14 (RAS0-N) of IC3, IC4?
  - No — Are negative pulses being put out to Pin 33 (CRAS0-N) of IC2 (LZ9FF22)?
    - • No — Failure of IC1 (MHM2029K)
  - Yes — Failure of IC2 (LZ9FF22)
- Yes — Are negative pulses being put out to Pins 30, 31 (CAS0-N, CAS2-N, CAS1-N, CAS3-N) of IC3, IC4?
  - No — Are negative pulses being put out to Pins 71, 70, 69, 68 (CCAS0-N, CCAS1-N, CCAS2-N, CCAS3-N) of Q13 (MHM2029K)?
    - • No — Failure of IC1 (MHM2029K)
  - YES — Replace IC16 (74ALS244).
- Yes — Replace IC3, IC4.

B-4 EEPROM error (ERROR 40)

- Replace IC19 (93LC46A).
- OK?
- No — Failure of IC1 (MHM2029K)

B-5 Option ROM error (ERROR 50)

- Replace PostScript SIMM.
- OK?
- No — Failure of IC1 (MHM2029K)

B-6 Flash SIMM error (ERROR 51)

- Replace Flash SIMM.
- OK?
- No — Failure of IC1 (MHM2029K)

B-7 Option RAM error (ERROR 60)

- Are negative pulses being pin out to Pins 33, 34, 44, 45 (RAS2-N, RAS3-N, RAS4-N, RAS5-N) of SIMM1, SIMM2?
  - No — Are negative pulses being put out to Pin 34, 35, 36, 37 (CRAS2-N, CRAS3-N, CRAS4-N, CRAS5-N) of IC2 (LZ9FF22)?
    - Yes — Failure of IC2 (LZ9FF22)
    - No — Failure of IC1 (MHM2029K)
  - Yes — Replace SIMM.

B-8 Cooling fan error (ERROR 70)

- Is the fan rotating?
  - No — Is +38V power being supplied to Pin 1 (FAN POW) of Connector (CN5) in Power supply board (120V or 230V)?
    - No — Is the output at Pin 22 (FANON) of Connector (Power) being at high level?
      - No — Is the output at Pin 109 (FANON-P) of IC1 (MHM2029K) being at high level?
        - No — Failure of IC1 (MHM2029K)
      - Yes — Replace IC17 (74LS07).
    - Yes — Replace Power supply board (120V or 230V).
  - Yes — Replace the fan.
- Yes — Is the output at Pin 21 (FANALARM) of Connector (Power) being at high level?
  - No — Failure of IC1 (MHM2029K)
- Yes — Replace the fan.

B-9 Thermistor OPEN error (ERROR 72)

- Is the heater lamp lit?
  - No — Is pin 6 of the connector (power) in the OFF state (High level)?
    - No — Failure of the heater or the Power supply board
    - Yes — Is pin 3 of TR4 (transistor) in the OFF state (High level)?
      - No — Replace TR4 (transistor).
      - Yes — Is pin 3 of TR5 (transistor) in the OFF state (Low level)?
        - No — Replace TR5 (transistor).
        - Yes — Failure of IC1 (MHM2029K)
  - Yes — Failure of the Power supply board (120V or 230V)

B-10 SSIO error (ERROR 74)

- Are POWTXD-P (Power connector-3), POWSCLK-N (Power connector-2) and POWLD-N (Power connector-1) operating normally?
  - No — Replace IC1 (MHM2029K).
  - Yes — Failure of the Power supply board (High voltage)

B-11 Opepanel I/F Timeout error (ERROR 80)

- Is the connection of connector (PANEL) properly?
  - No — Replace connector (PANEL).
  - Yes — Failure of IC1 (MHM2029K)

B-12 Option tray I/F Timeout error (ERROR 81)

- Is the connection of connector (2nd tray) properly?
  - No — Replace connector (2nd tray).
  - Yes — Is the connection of connector (envelope) properly?
    - No — Replace connector (envelope).
    - Yes — Failure of IC2 (LZ9FF22)

B-13 Duplex I/F timeout error (ERROR 83)

- Is the connection of connector (DUP) properly?
  - No Replace connector (DUP).
- Yes Failure of IC2 (LZ9FF22)

B-14 Watchdog timer timeout (ERROR 90)

- Replace IC5–IC8.
- OK?
- No Failure of IC1 (MHM2029K)

B-15 Program error (ERROR F*)

- Replace IC5–IC8.
- OK?
- No Failure of IC1 (MHM2029K)

B-16 Processor error (ERROR 0*)

- Replace IC5–IC8.
- OK?
- No Failure of IC1 (MHM2029K)

B-17 Cover OPEN occurs frequently.

- Is the signal at Pin 125 (+5VD) of IC1 (MHM2029K) being at low level?
  - Yes Is the signal at Pin 7 of Connector (Power) being at high level (30V)?
    - No Failure of an element other than AAA-PCB
  - Yes Is the signal at Pin 3 of TR503 being at low level?
    - No Replace TR503.
  - Yes Is the signal at Pin 3 of TR501 being at high level?
    - No Replace TR501.
  - Yes Failure of IC1 (MHM2029K)
- No Failure of IC1 (MHM2029K)

B-18 PAPER INPUT JAM occurs.

- Is the hopping motor rotating normally?
  - No — Are the normal waveforms of the HMPH1-P, HMPH2-P and HMON-N signals as shown in section 3.9 (2) output to pins 13, 8 and 7, 14 of HOPPING (A2918) respectively?
    - • No — Failure of IC2 (LZ9FF22)
  - Yes — Is the voltage at Pin 5 of HOPPING (A2918) +38V?
    - No — Is there the continuity in Fuse FU4?
      - • No — Replace FU4.
    - Yes — Failure of Power supply board (120V or 230V)
  - Yes — Is the voltage at pin 1, 2, 4 and 17 of HOPPING (A2918) +38V?
    - • No — Replace HOPPING (A2918).
  - Yes — Failure of Hopping motor
- Yes — Is the feeding roller rotating normally?
  - No — Does the 2 pin of TR505 is change to High level during the hopping roller is rotating?
    - • No — Failure of IC2 (LZ9FF22)
  - Yes — Does the 3 pin of TR1 change to Low level during the hopping motor is rotating?
    - • No — Replace TR 505.
  - Yes — Does the 2 pin of TR1 change to High level (+38V) during the hopping roller is rotating?
    - • No — Replace TR1.
  - Yes — Failure of clutch
- Yes — Can a paper reach the Inlet sensor?
  - • No — Failure of mechanical parts
- Yes — Failure of Power supply board (High voltage)

B-19 Paper feed JAM occurs

- Is the registration roller normally rotating for paper feed?
  - No — Does the 2 pin of TR 506 change to High level for paper feed?
    - No — Failure of IC2(LZ9FF22)
  - Yes — Does the 3 pin of TR2 change to Low level for paper feed?
    - No — Replace TR506.
  - Yes — Does the 2 pin of TR2 change to High level (+38V) for paper feed?
    - No — Replace TR2.
  - Yes — Does the connector (CLR) have any trouble?
    (Carry out a connection check towards the connection cord and connector at the same time.)
    - No — Replace the connector (CLR).
  - Yes — Failure of clutch
- Yes — Can a paper reach the Paper sensor?
  - No — Failure of mechanical parts
- Yes — Is Paper sensor signal normally input to the 123 pin of the IC1(MHM2029K)?
  - No — Does the connector (POWER) have any trouble?
    (Carry out a connection check towards the connection cord and connector at the same time.)
    - No — Replace the connector (POWER).
  - Yes — Failure of Power supply board (High voltage)
- Yes — Failure of IC1 (MHM2029K)

B-20 Duplex input JAM occurs

- Are papers fed to the Duplex unit normally?
  - No — Are paper sensor signals normally output to the 12 pin of the connector (DUP)?
    - • No — Replace IC20.
  - Yes — Does the connector (DUP) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time.)
    - • No — Replace the connector (DUP).
  - Yes — Failure of Duplex unit or Connection Code-Wire
- Yes — Failure of Duplex unit

B-21 Duplex feed JAM 1 occurs

- Is the Duplex unit motor rotating after a paper is fed into the Duplex unit.
  - No — Are Outlet sensor signals normally input to the 7 pin of the connector (DUP)?
    - • No — Are Outlet sensor signals normally input to the 8 pin of the connector (POWER)?
      - • Yes — Failure of IC2 (LZ9FF22)
    - No — Does the connector (POWER) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time)
      - • No — Replace connector(POWER)
    - Yes — Failure of Power supply board (High voltage) or Connection Code-Wire.
  - Yes — Does the connector (DUP) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time)
    - • No Replace the connector (DUP)
  - Yes — Failure of Duplex unit or Connection Code-Wire
- Yes — Failure of Duplex unit

B-22 PAPER SIZE ERROR occurs.

- Do the output signals (PAPER SIZE 0 to 3 -N) at pins 15, 16, 17 and 18 of IC2 (LZ9FF22) comply with the following table?

Paper size	Pin 15	Pin 16	Pin 17	Pin 18
Letter	L	H	H	H
Executive	L	H	L	H
A4	L	L	H	H
Legal 14	H	H	H	L
Legal 13	H	L	H	H
B5	H	H	L	H
A5	H	H	L	L

  - No Check to see if the paper size SW of the paper tray is set properly.
- Yes Failure of IC2 (LZ9FF22)

B-23 The message "STACKER FULL REMOVE THE PAPER" remains displayed on the LCD.

- Is the output signal (STKFULL-P signal) at pin 159 of IC1 (MHM2029K) being at low level?
  - No Check the stacker full sensor.
- Yes Failure of IC1 (MHM2029K)

B-24 The message "PAPER OUT ******** TRAY1" remains displayed on the LCD

- Is there any change in signal (PAPEREND-N) at the pin 21 of the IC2 (LZ9FF22) when moving the Paper end sensor lever?
  - No — Does the connector (END) have any trouble?
    (Carry out a connection check towards the connection cord and connector at the same time.)
    - No — Replace the connector (END)
  - Yes — Failure of Paper end sensor or Connection Cord-Wire
- Yes — Do the output signals (PAPERSIZE0 to 3 -N) at pins 15, 16, 17 and 18 of IC2 (LZ9FF22) comply with the following table?

Paper size	Pin 15	Pin 16	Pin 17	Pin 18
Letter	L	H	H	H
Executive	L	H	L	H
A4	L	L	H	H
Legal 14	H	H	H	L
Legal 13	H	L	H	H
B5	H	H	L	H
A5	H	H	L	L

  - No — Does the connector (SIZE) have any trouble?
    (Carry out a connection check towards the connection cord and connector at the same time.)
    - No — Replace the connector (SIZE).
  - Yes — Failure of Paper size sensor board (PXC-PCB) or paper size SW of the paper tray
- Yes — Failure of IC2 (LZ9FF22)

B-25 The message "PAPER NEAREND T1" remains displayed on the LCD

- Is there any change in signal (PAPERLOW-N) at the 80 pin of the IC2 (LZ9FF22)?
  - No — Does the connector (LOW) have any trouble?
    (Carry out a connection check towards the connection cord and connector at the same time.)
    - No — Replace the connector (LOW)
  - Yes — Failure of Paper nearend sensor or Connection Cord-Wire
- Yes — Failure of IC2 (LZ9FF22)

B-26 The message "TONER SENSOR" remains displayed on the LCD

- Is the main motor rotating normally?
  - No — Are the normal waveforms of the DMPH1-P, DMPH2-P and DMON-N signals as shown in section 3.9(1) output to pins 7, 8, 13 and 14 of MAIN (A2918) respectively?
    - • No — Failure of IC1 (MHM2029K)
  - Yes — Is the voltage at pin 5 of MAIN (A2918) +38V?
    - No — Is there the continuity in Fuse FU3?
      - • No — Replace FU3.
    - Yes — Failure of Power supply board (120V or 230V)
  - Yes — Is the voltage at pin 1, 2, 4 and 17 of MAIN (A2918) +38V?
    - • No — Replace MAIN (A2918).
  - Yes — Does the connector (MOTOR) have any trouble?
    (Carry out a connection check towards the connection cord and connector at the same time.)
    - • No — Replace the connector (MOTOR).
  - Yes — Failure of Main motor
- Yes — Does the connector (POWER) have any trouble?
  (Carry out a connection check towards the connection cord and connector at the same time.)
  - • No — Replace the connector (POWER).
- Yes — Failure of IC1 (MHM2029K)

B-27 Data sent through the centronics I/F cannot be received.

- Is the signal at Pin 11 (BUSY-P) of connector (CENT) being at low level?
  - No — Is the signal at Pin 1 (BUSY-P) of IC17 (74LS07) changed as shown below, at data reception?

	ON-LINE	OFF-LINE
BUSY-P	Low	High

    - No — Failure of IC1 (MHM2029K)
    - Yes — Replace IC17 (74LS07).
  - Yes — Is the level of the signal at Pin 1 (STB-N) of connector (CENT) changed at data reception?
    - No — Make sure of the connection of I/F cable or the operation of the host computer.
  - Yes — Is the signal at Pin 3 (ACK-N), IC17 (74LS07) being respectively at low level at data reception?
    - Yes — Replace IC17 (74LS07).
    - OK?
    - No
  - No — Failure of IC1 (MHM2029K)

B-28 Data sent through the RS232C I/F cannot be received

- Is the voltage -8V at the 1 pin of the IC18 (75188)?
  - No — Does the connector (POWER) have any trouble?
    (Carry out a connection check towards the connection cord and connector at the same time.)
    - No — Replace the connector (POWER).
    - Yes — Failure of Power supply board (120V or 230V) or Connection Code-Wire
  - Yes — Is there any change in signal (DEBUGRXD-N) at the 101 pin of the IC1 (MHM2029K) when receiving data from the host computer?
    - No — Does the connector (RS232C) have any trouble?
      (Carry out a connection check towards the connection cord and connector at the same time.)
      - No — Replace the connector (RS232C).
      - Yes — Make sure of setting of a host computer.
    - Yes — Is there any change in signal (DEBUGTXD-P) at the 2 pin of the IC18 (75188) when receiving data from the host computer?
      - No — Failure of IC1 (MHM2029K)
      - Yes — Is there any change in signal (TXD) at the 2 pin of the connector (RS232C) when receiving data from the computer?
        - No — Replace IC 18(75188)
        - Yes — Does the connector (RS232C) have any trouble?
          (Carry out a connection check towards the connection cord and connector at the same time.)
          - No — Replace the connector (RS232C)
          - Yes — Make sure of setting of a host computer.

C-1 Abnormal message display on the LCD (no display, display some dot lit, etc.).

- Replace IC2 (HD44780).
- OK?
- No Replace IC3 (MSM5259).
- OK?
- Replace IC1 (BU6152S).

C-2 The key switch operation on the operator panel is disabled.

- Are the level of the signal at Pins, 3, 7, 10, 18, 23, 31 of IC1 (BU6152S) changed from the high level to the low one by the key switch pushing?
  - No Replace SW1 to SW8.
- Yes Is the connection of CN1 correct?
  - No Connect it correctly.
- Yes Replace IC1 (BU6152S).

D-1 PAPER SIZE ERROR occurs.

- Does the PAPER SIZE 0 signal at pin 4 of CN11 go LOW when SW1 is depressed and does the same signal go HIGH when SW1 is not depressed?
  - No Replace SW1.
- Yes Does the PAPER SIZE 1 signal at pin 3 of CN11 go LOW when SW2 is depressed and does the same signal go HIGH when SW2 is not depressed?
  - No Replace SW2.
- Yes Does the PAPER SIZE 2 signal at pin 2 of CN11 go LOW when SW3 is depressed and does the same signal go HIGH when SW3 is not depressed?
  - No Replace SW3.
- Yes Does the PAPER SIZE 3 signal at pin 1 of CN11 go LOW when SW4 is depressed and does the same signal go HIGH when SW4 is not depressed?
  - No Replace SW4.
- Yes Replace Core Assy. -FFC.

5. CIRCUIT DIAGRAM

Figure 5-1(1/17~17/17)	Main Controller PCB	(AAA-PCB, Rev.4)
Figure 5-2(1/3~3/3)	Operation Panel PCB	(PCO-PCB, Rev.2)
Figure 5-3(1/1)	Cassette Switch PCB	(PXC-PCB, Rev.3)

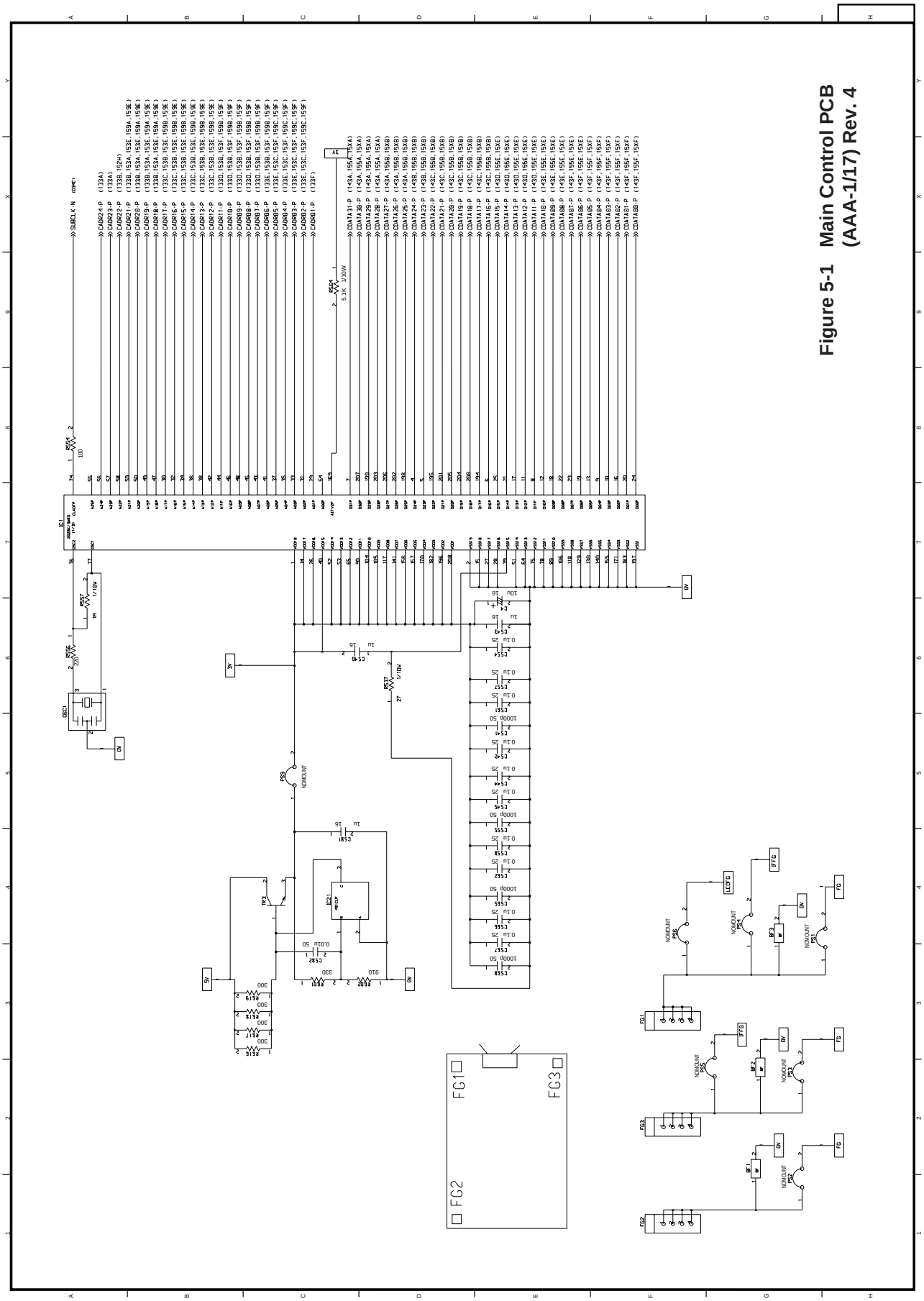


Figure 5-1 Main Control PCB (AAA-1/17) Rev. 4

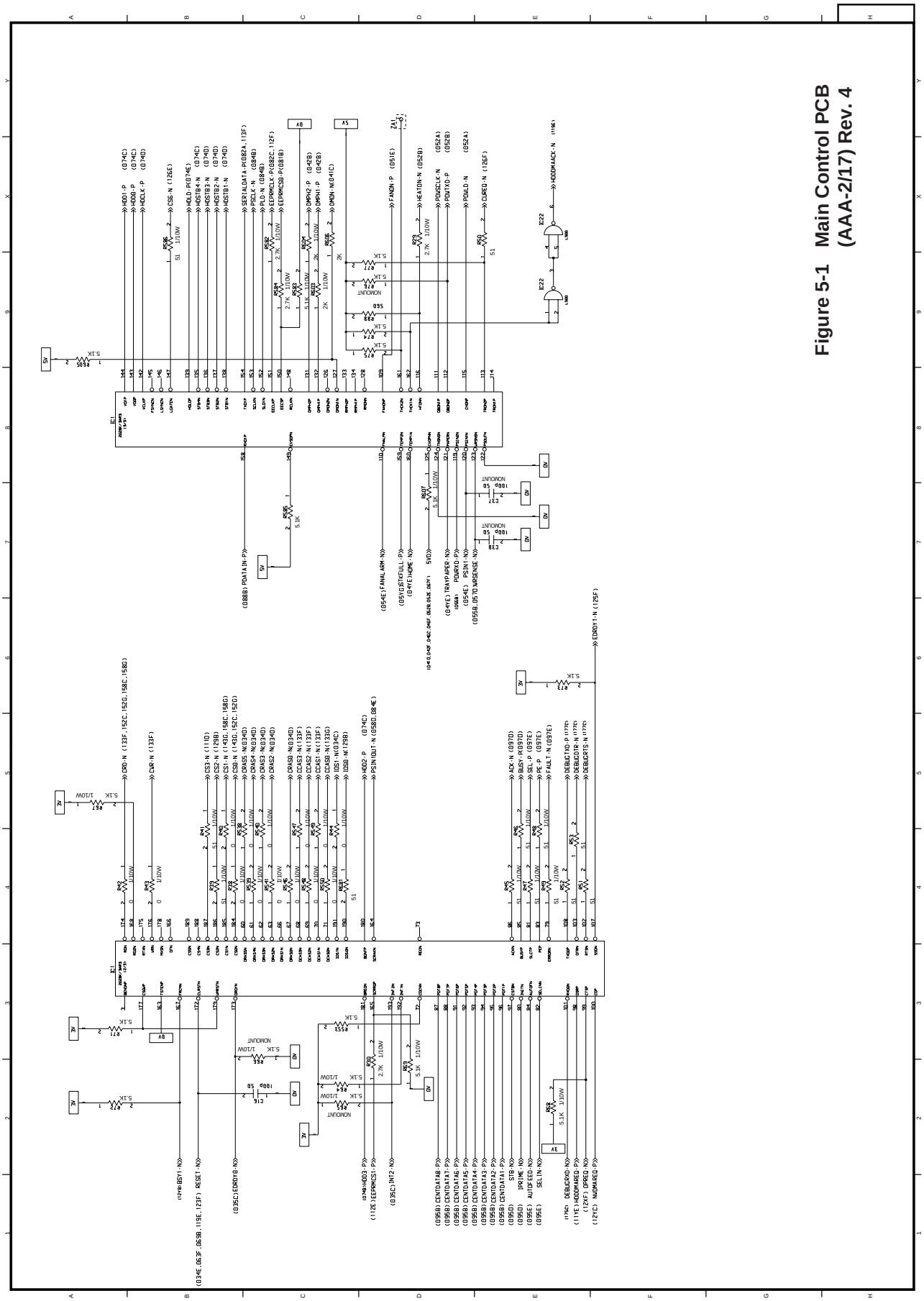


Figure 5-1 Main Control PCB (AAA-2/17) Rev. 4

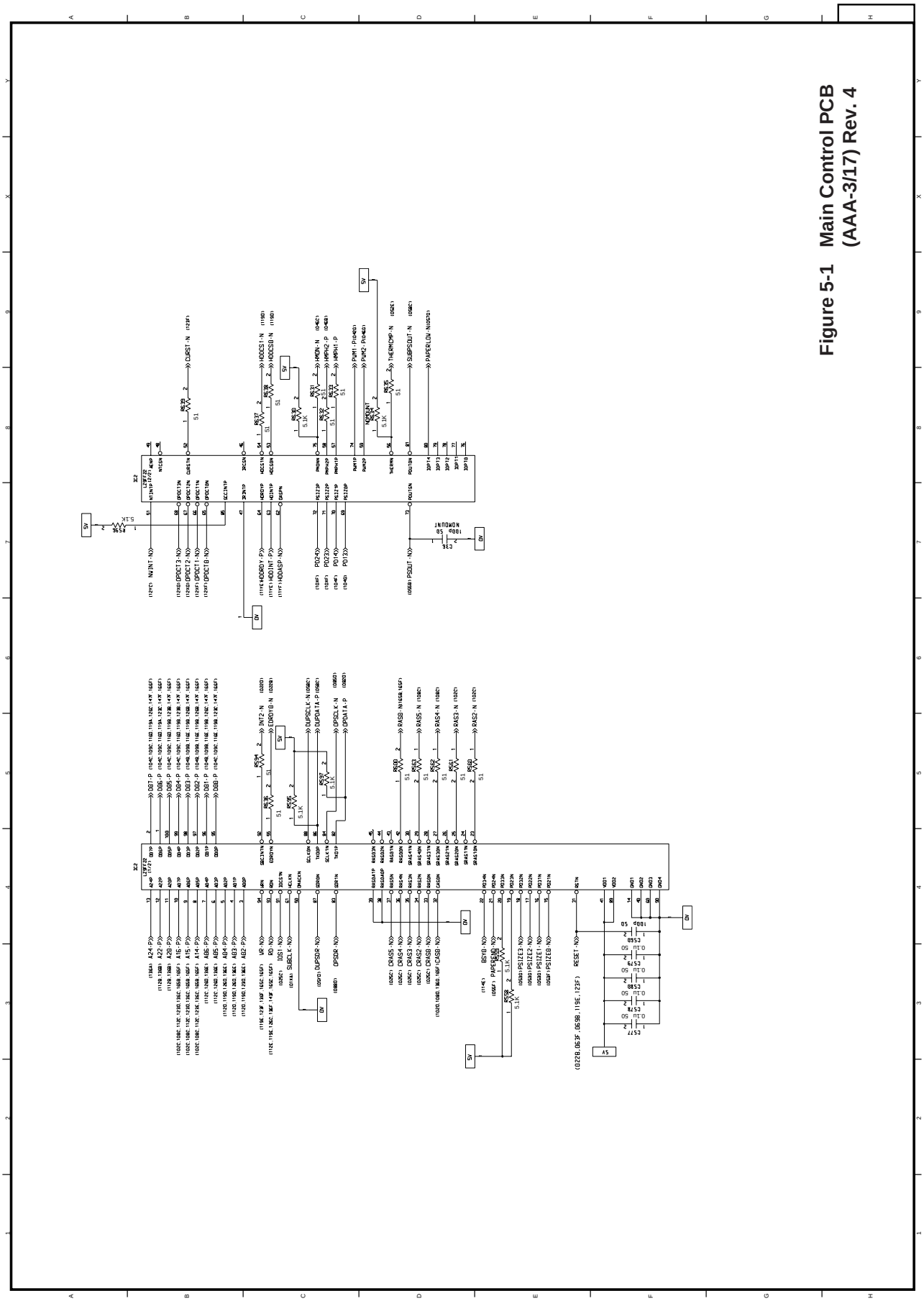


Figure 5-1 Main Control PCB (AAA-3/17) Rev. 4

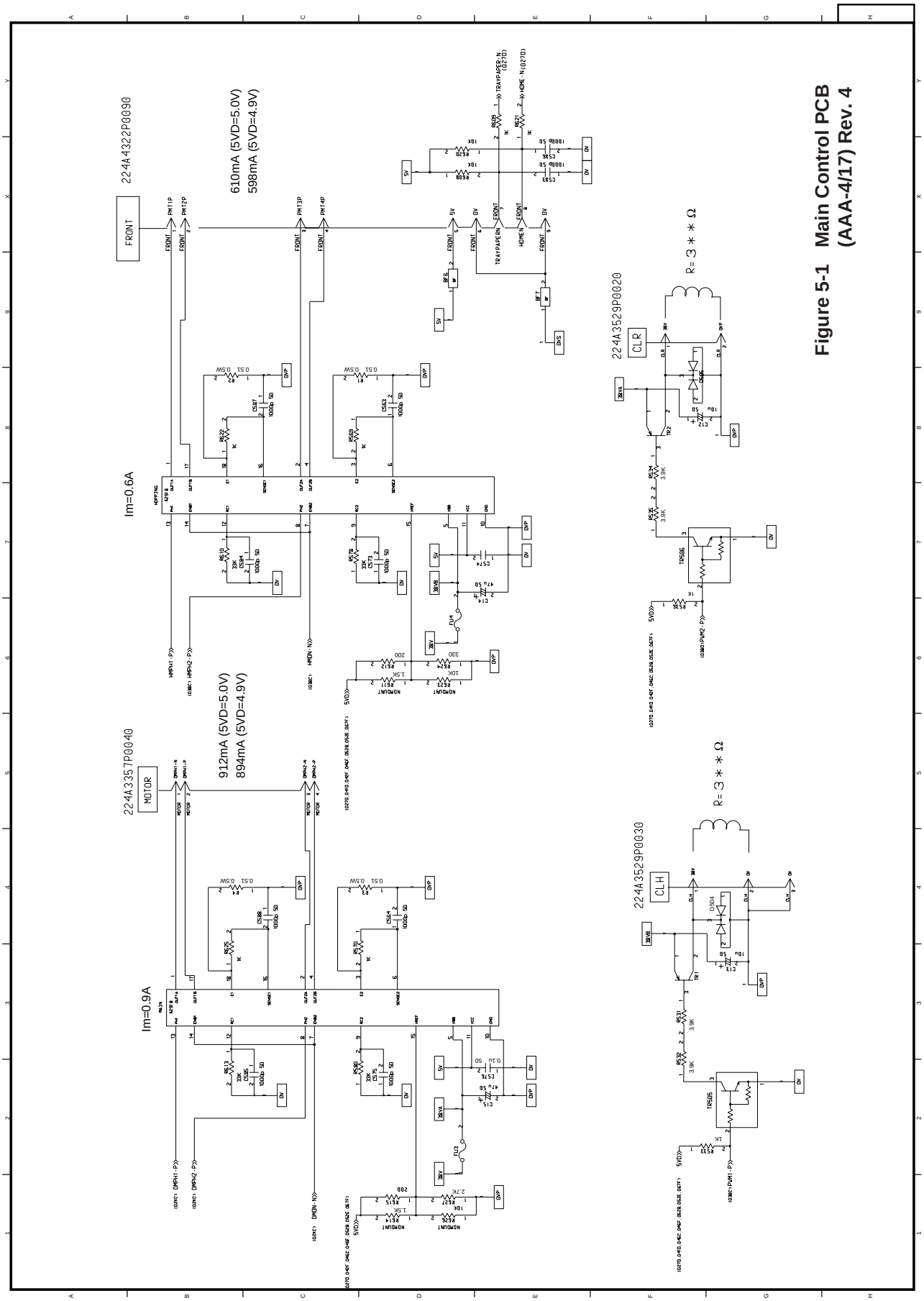


Figure 5-1 Main Control PCB (AAA-4/17) Rev. 4

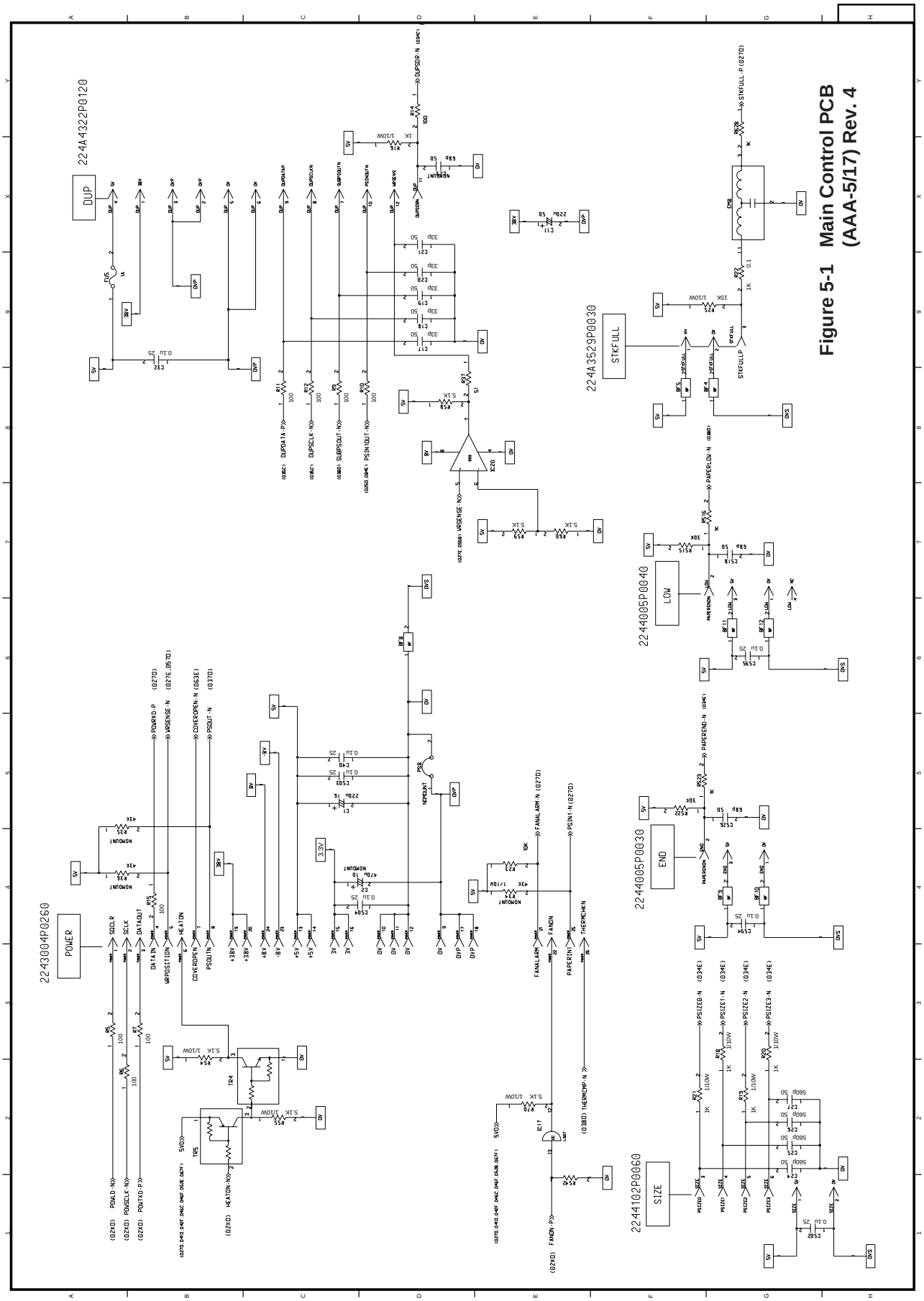


Figure 5-1 Main Control PCB (AAA-5/17) Rev. 4

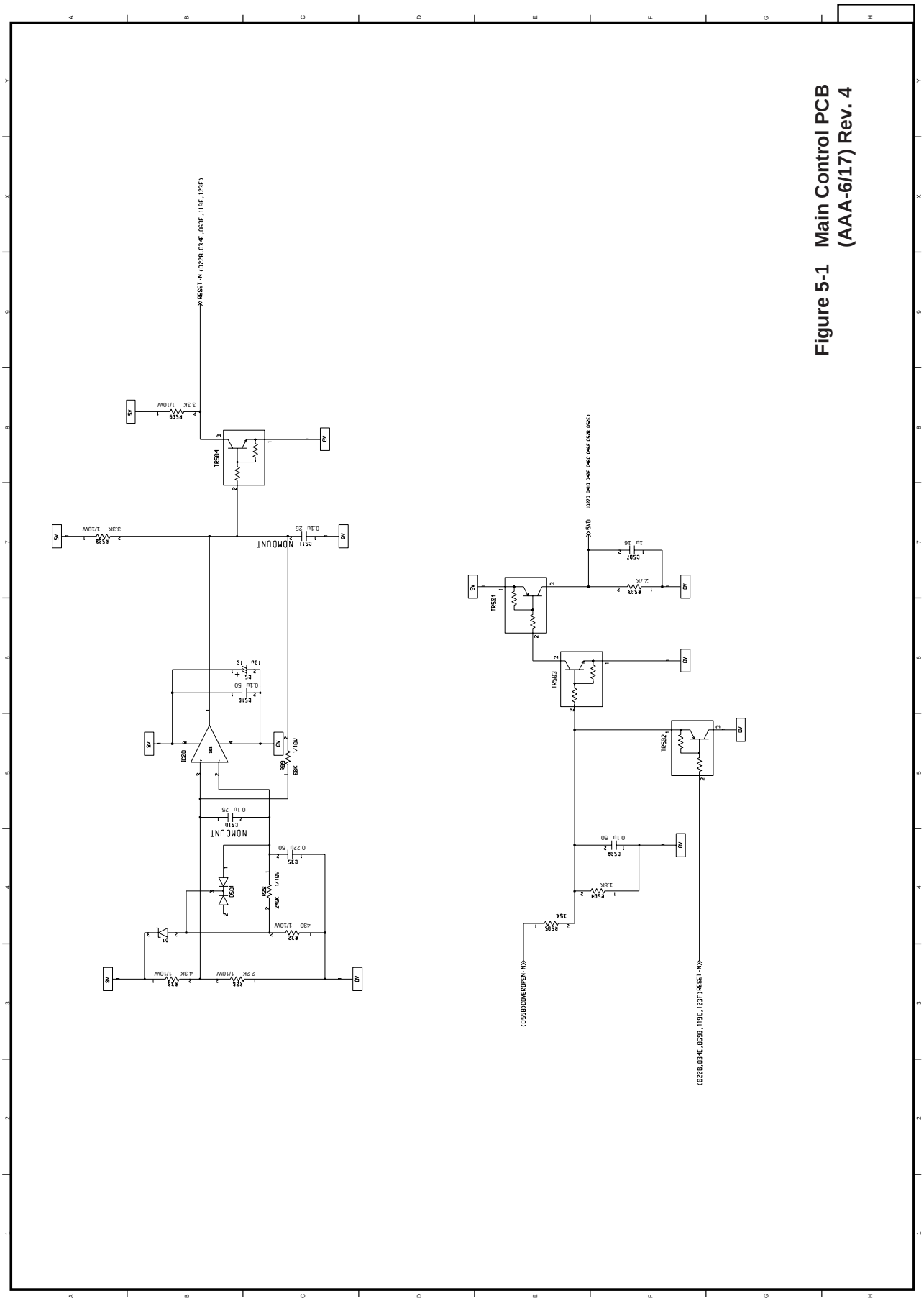


Figure 5-1 Main Control PCB (AAA-6/17) Rev. 4

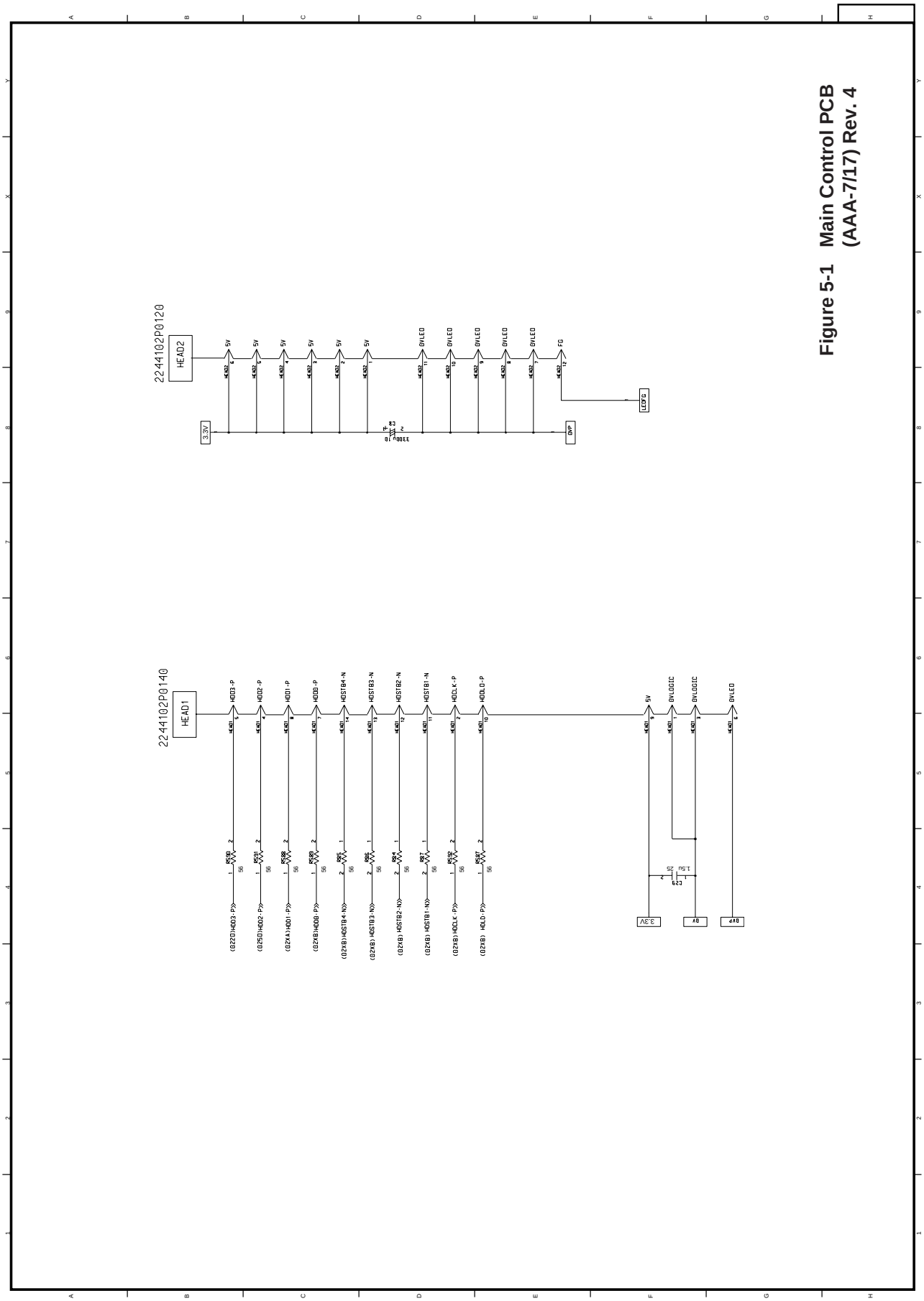


Figure 5-1 Main Control PCB (AAA-7/17) Rev. 4

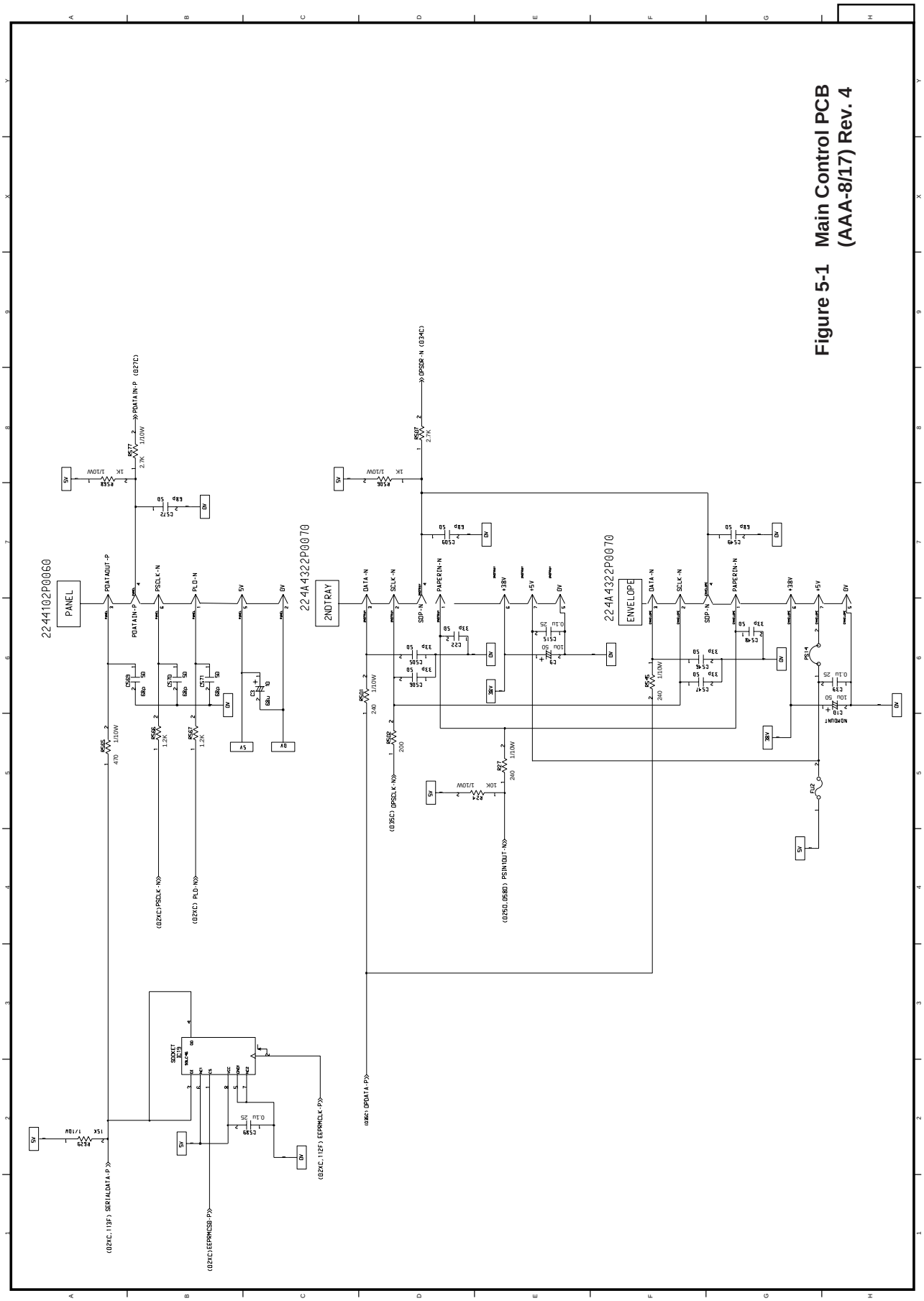


Figure 5-1 Main Control PCB (AAA-8/17) Rev. 4

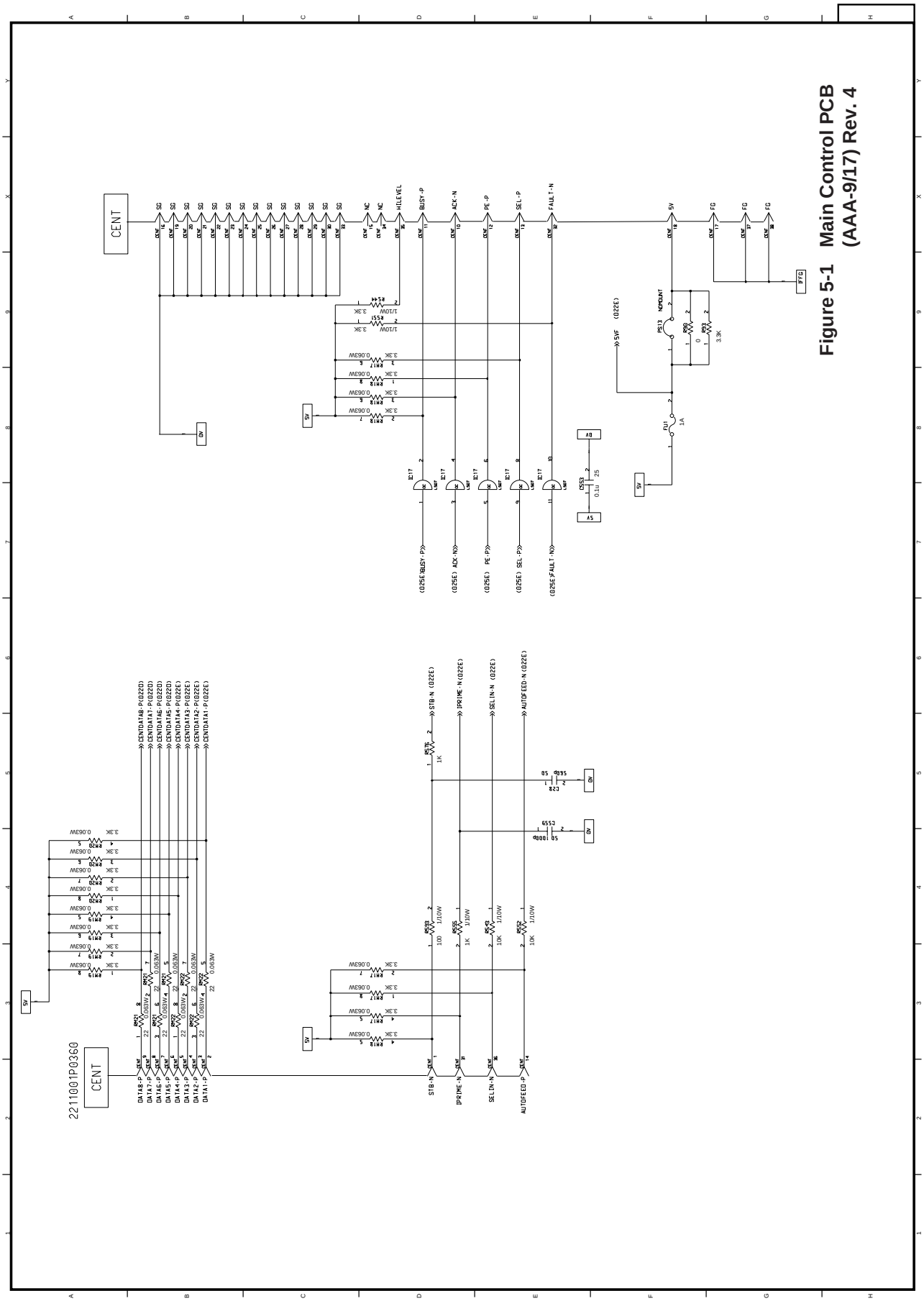


Figure 5-1 Main Control PCB (AAA-9/17) Rev. 4

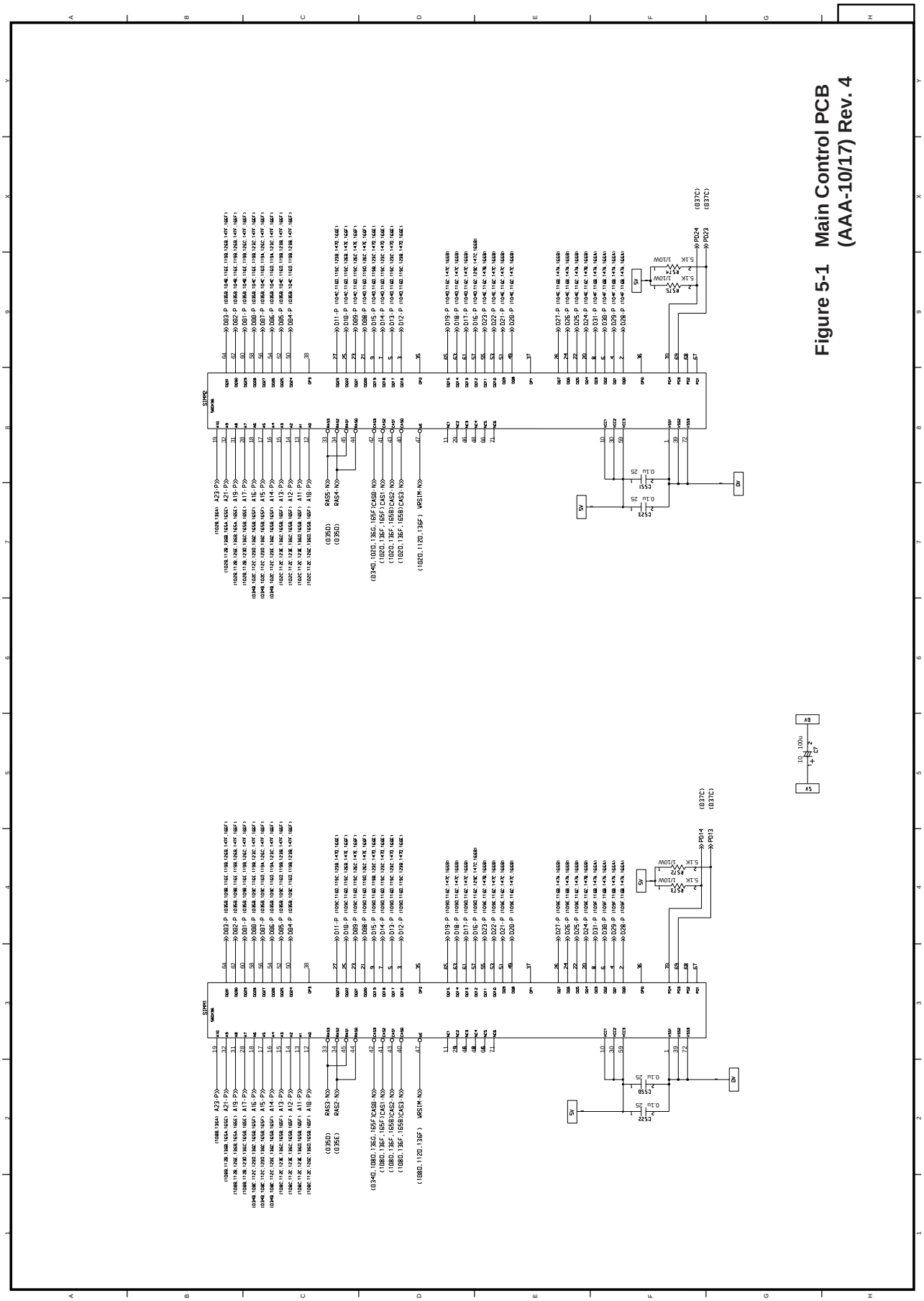


Figure 5-1 Main Control PCB (AAA-10/17) Rev. 4

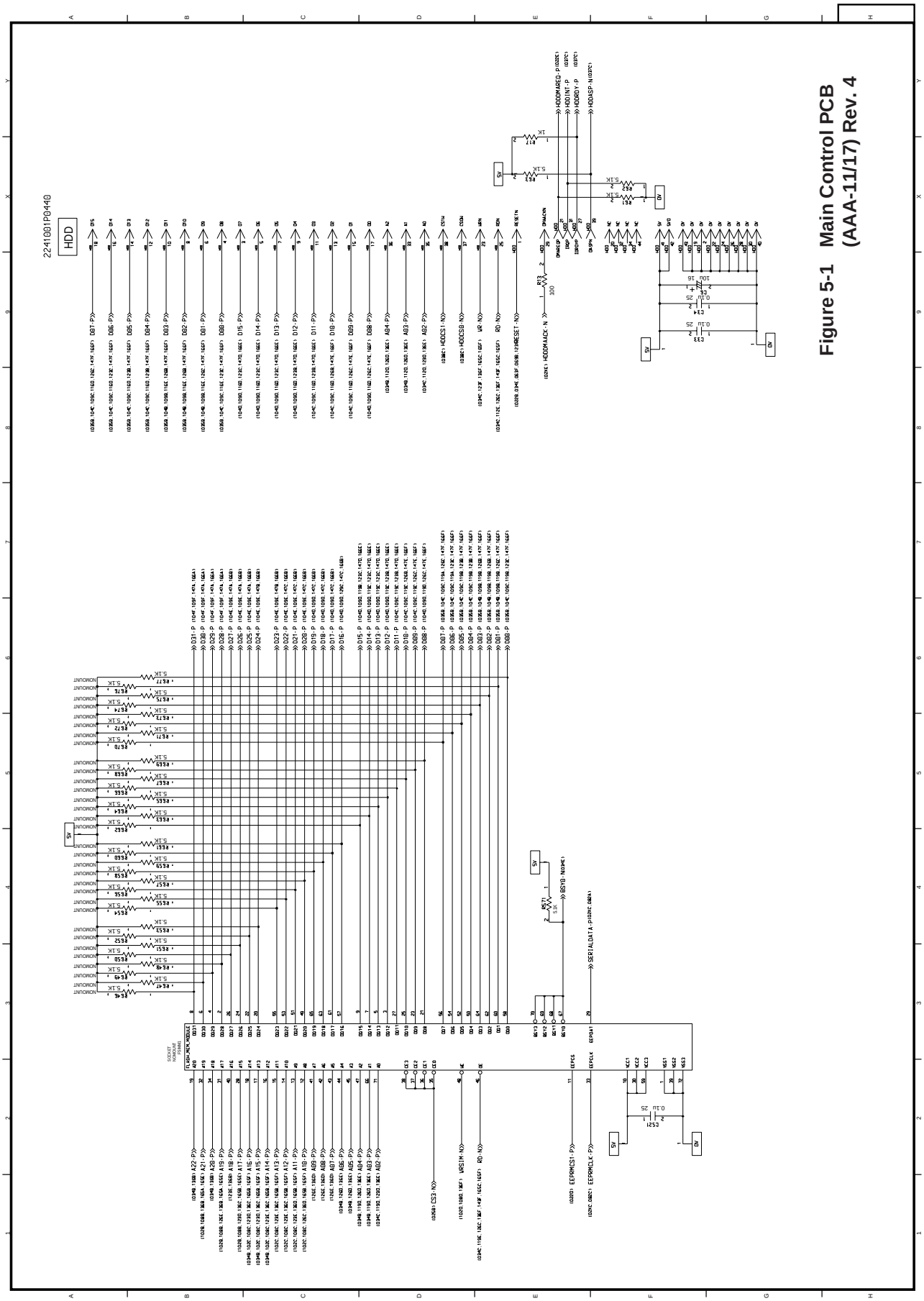


Figure 5-1 Main Control PCB (AAA-11/17) Rev. 4

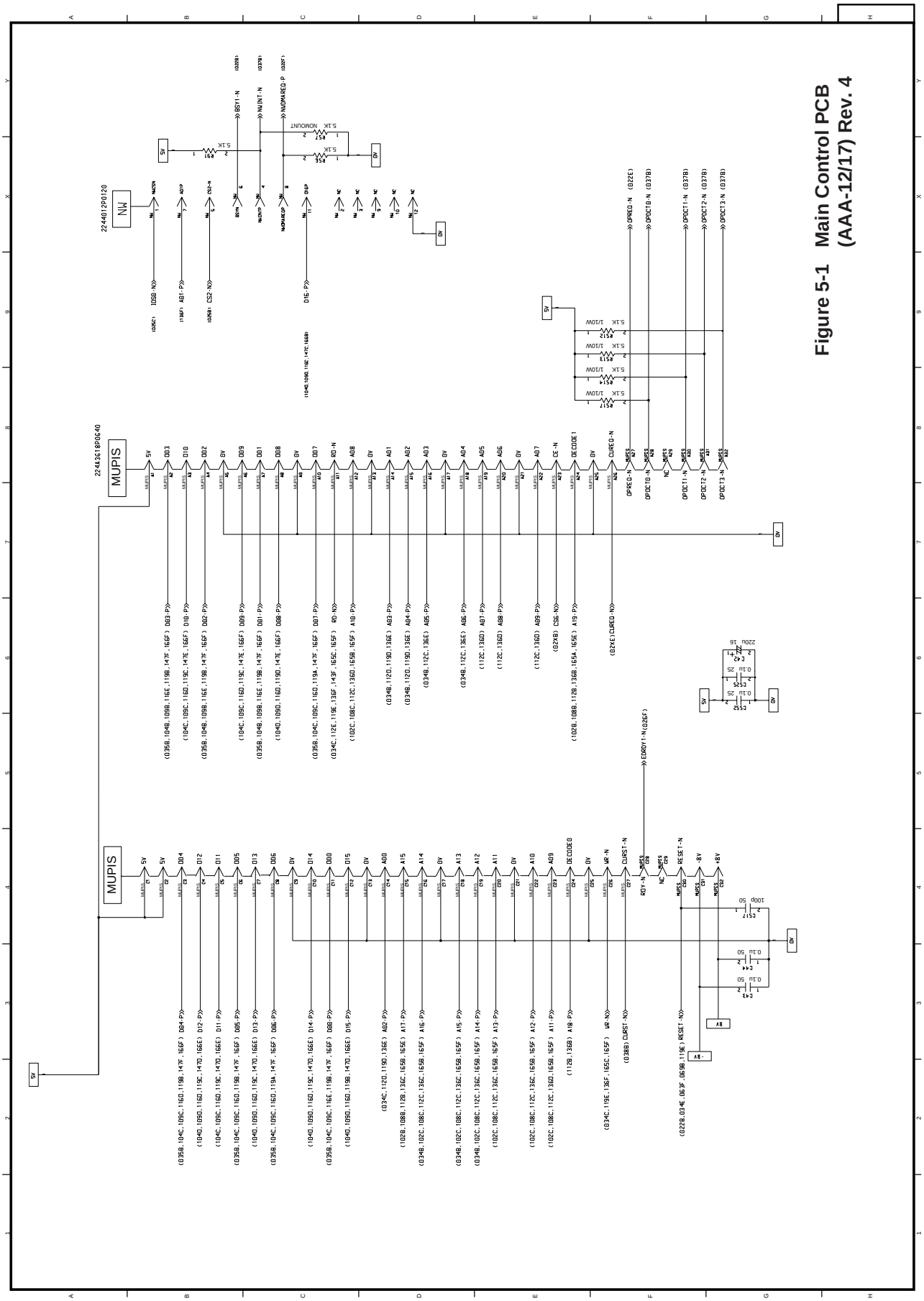


Figure 5-1 Main Control PCB (AAA-12/17) Rev. 4

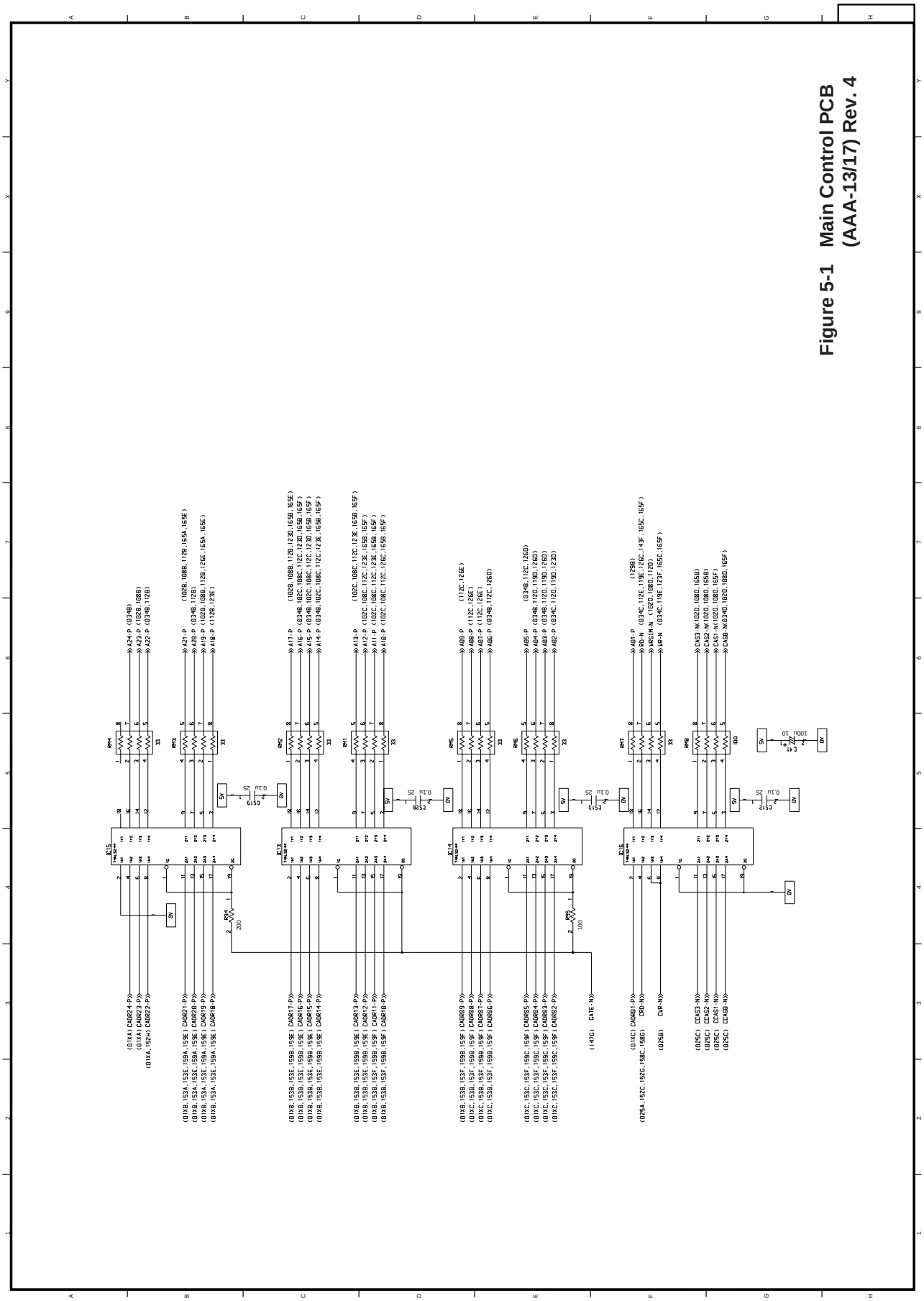


Figure 5-1 Main Control PCB (AAA-13/17) Rev. 4

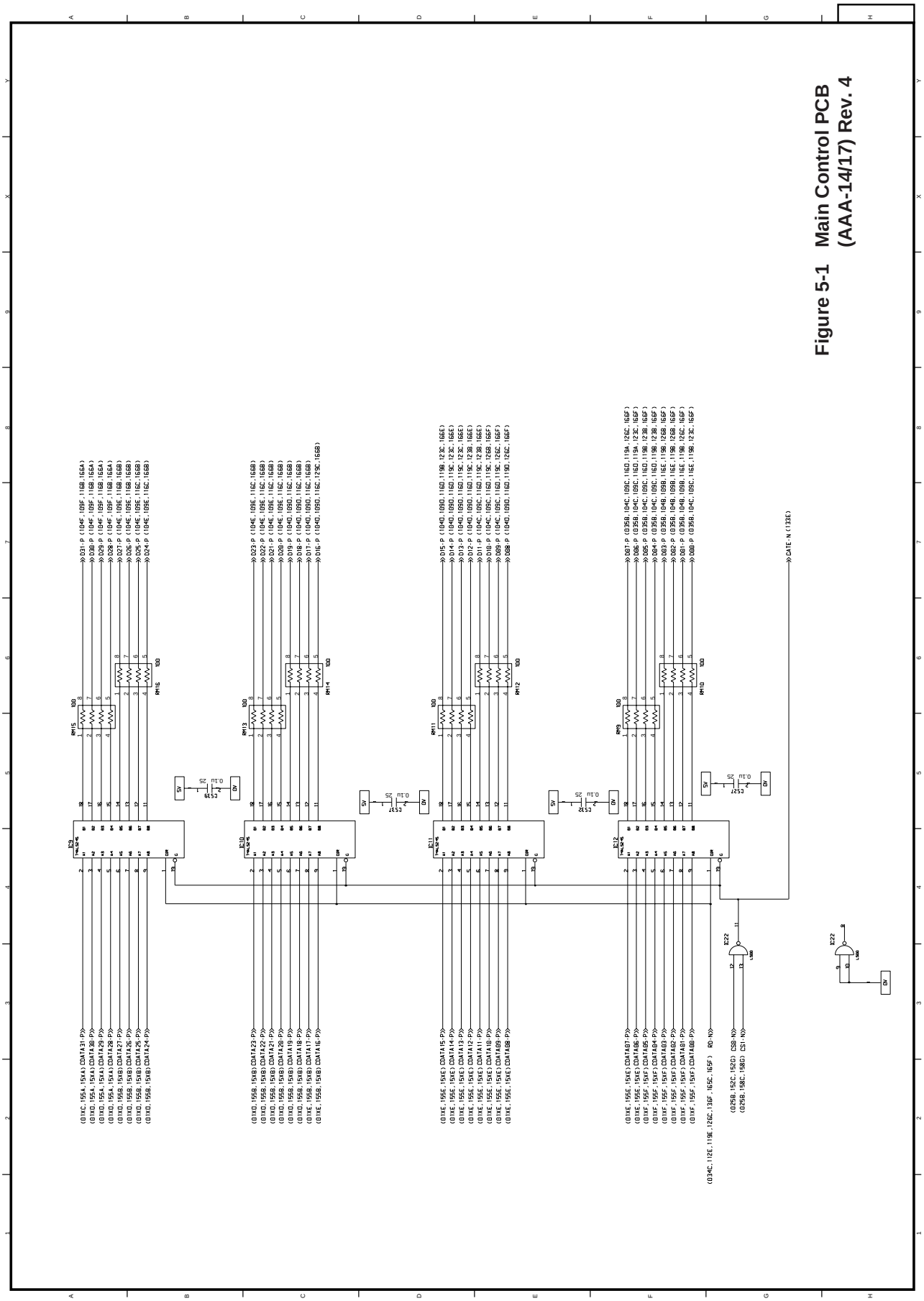


Figure 5-1 Main Control PCB (AAA-14/17) Rev. 4

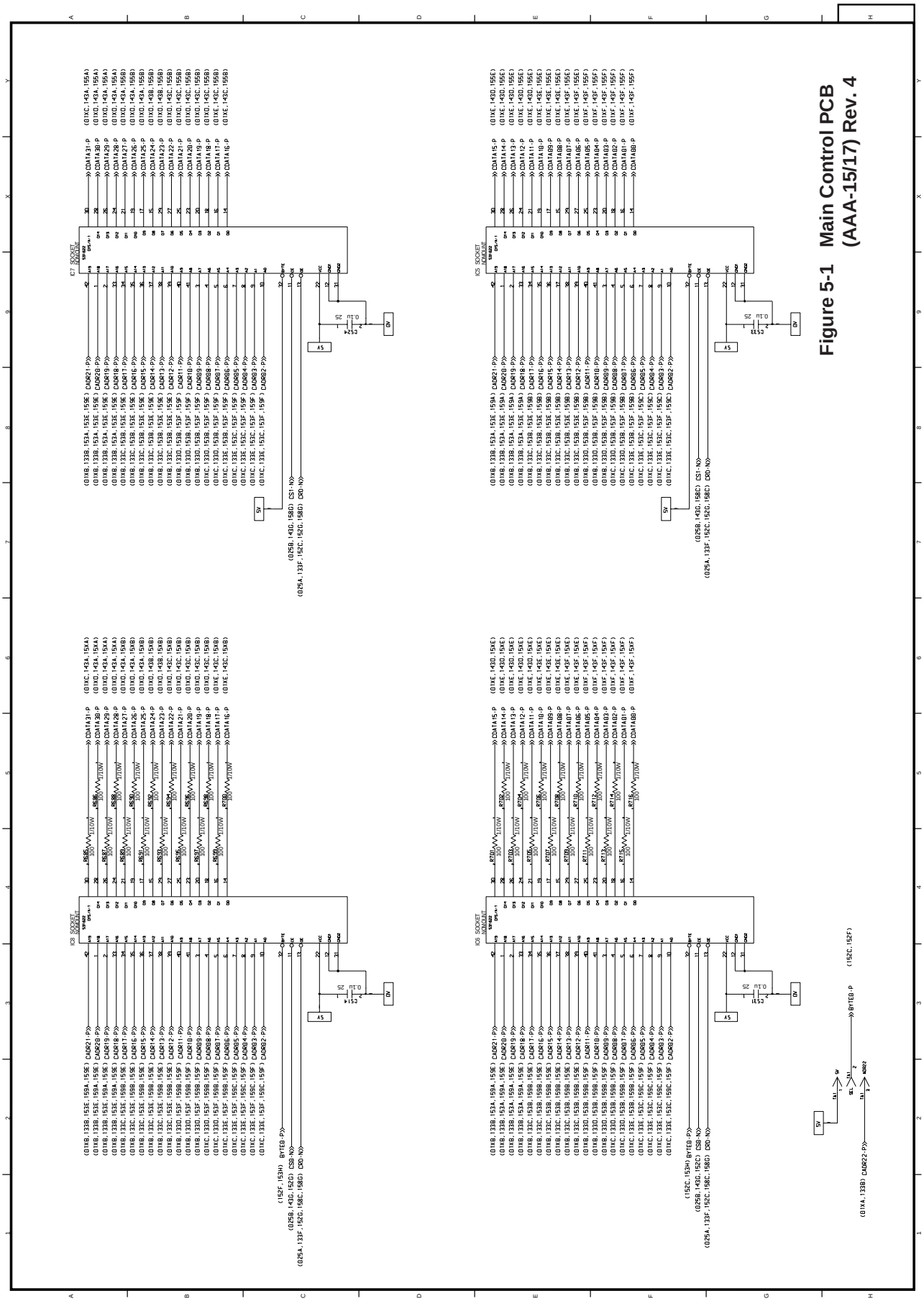


Figure 5-1 Main Control PCB (AAA-15/17) Rev. 4

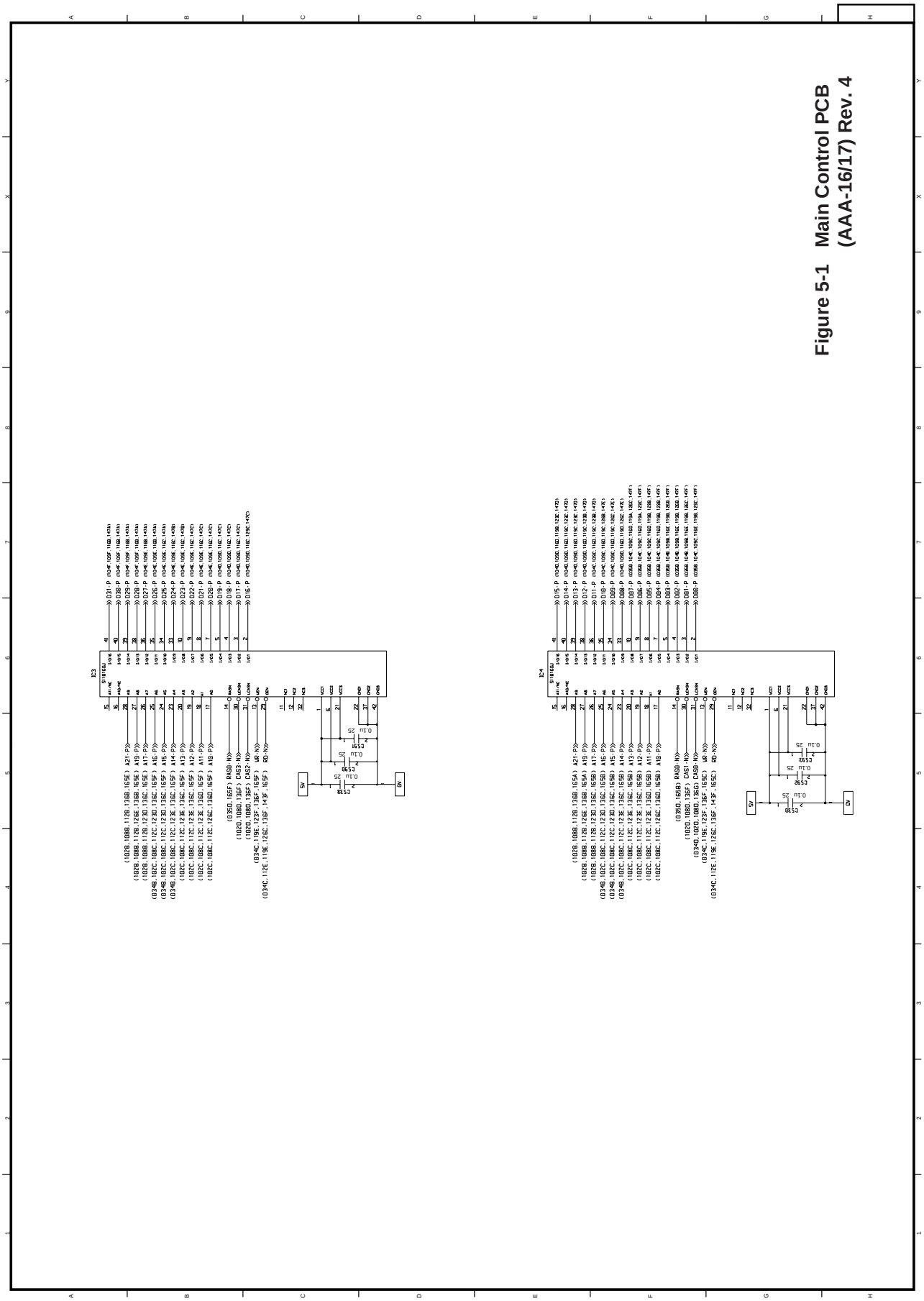


Figure 5-1 Main Control PCB (AAA-16/17) Rev. 4

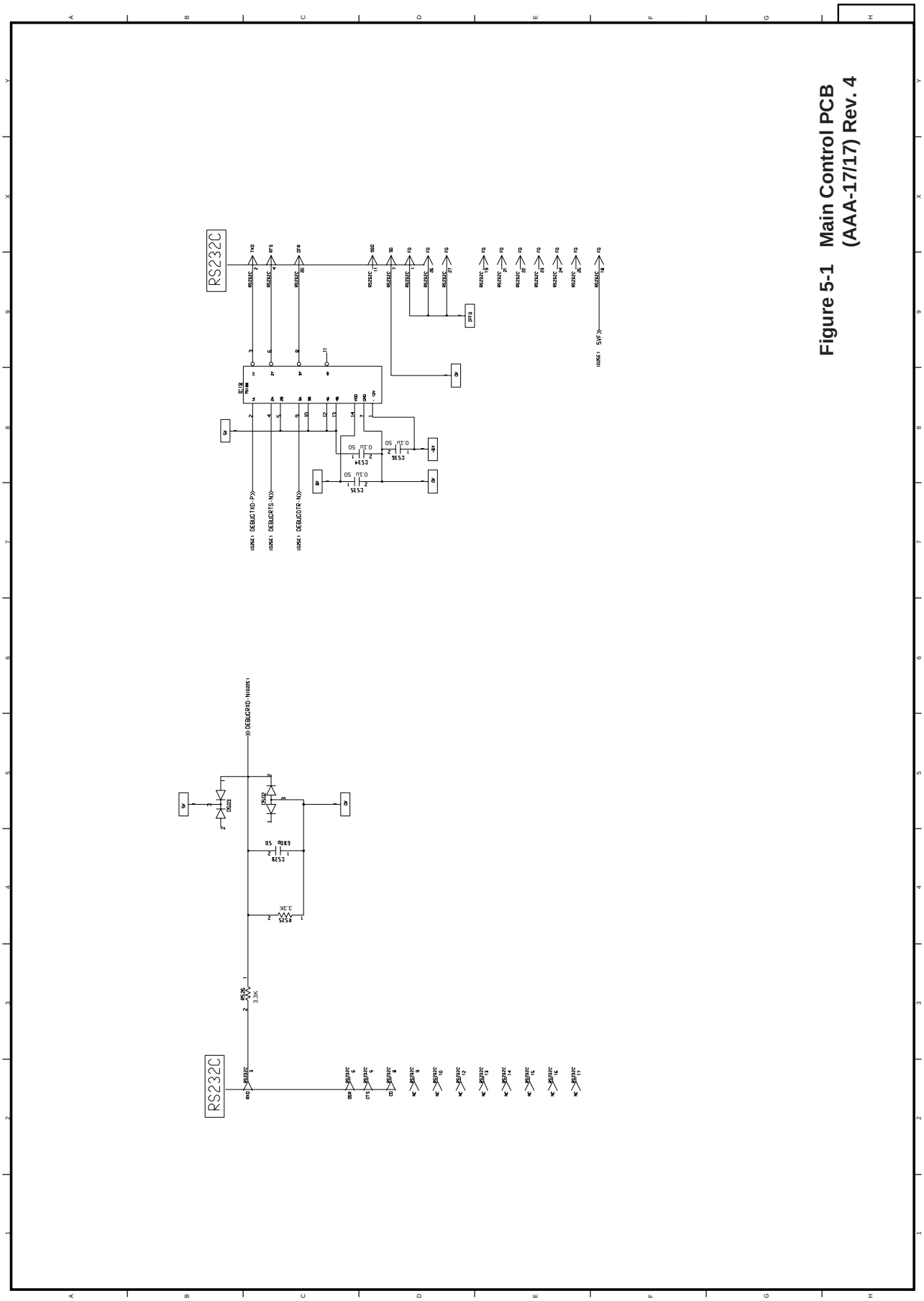


Figure 5-1 Main Control PCB (AAA-17/17) Rev. 4

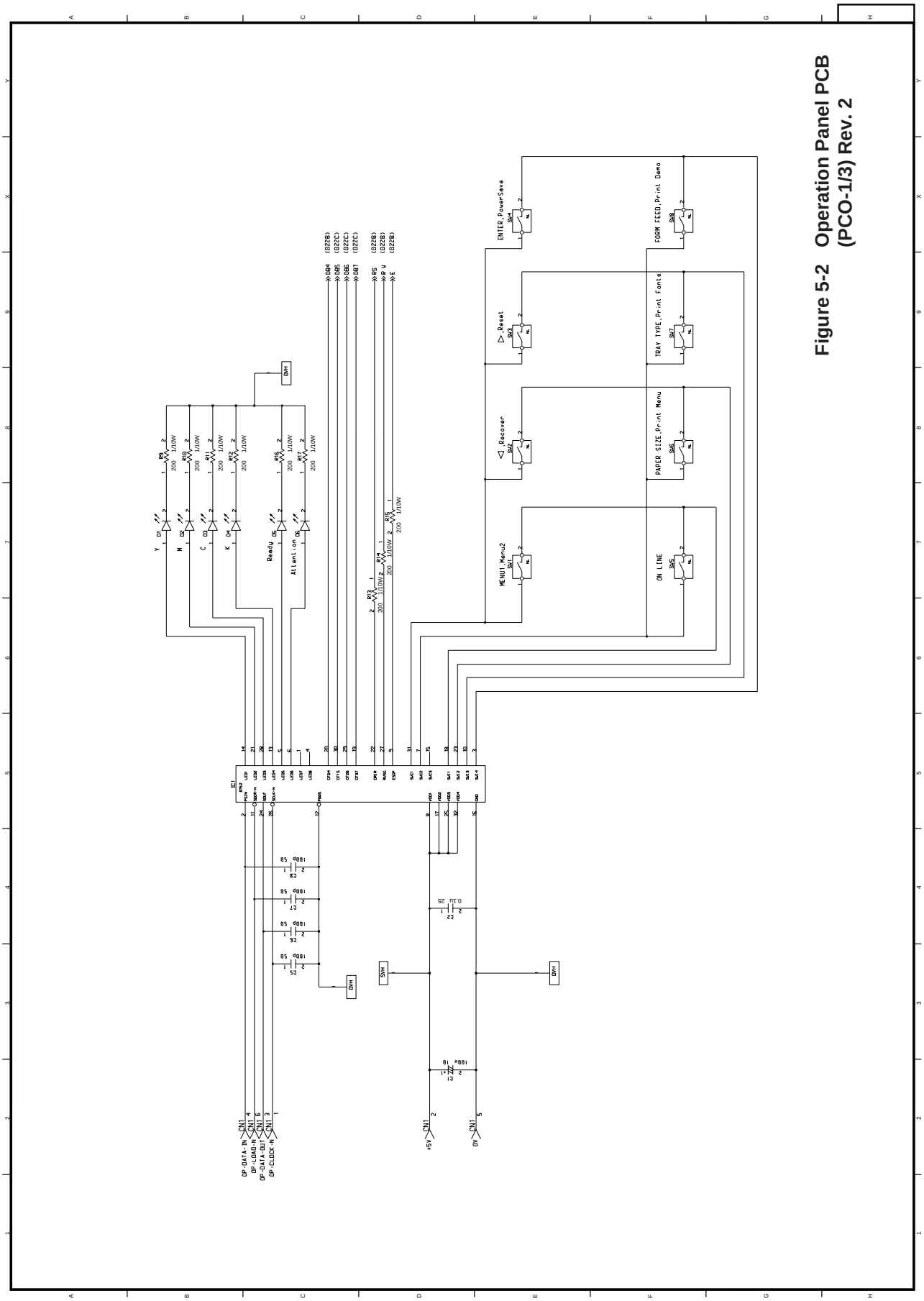


Figure 5-2 Operation Panel PCB (PCO-1/3) Rev. 2

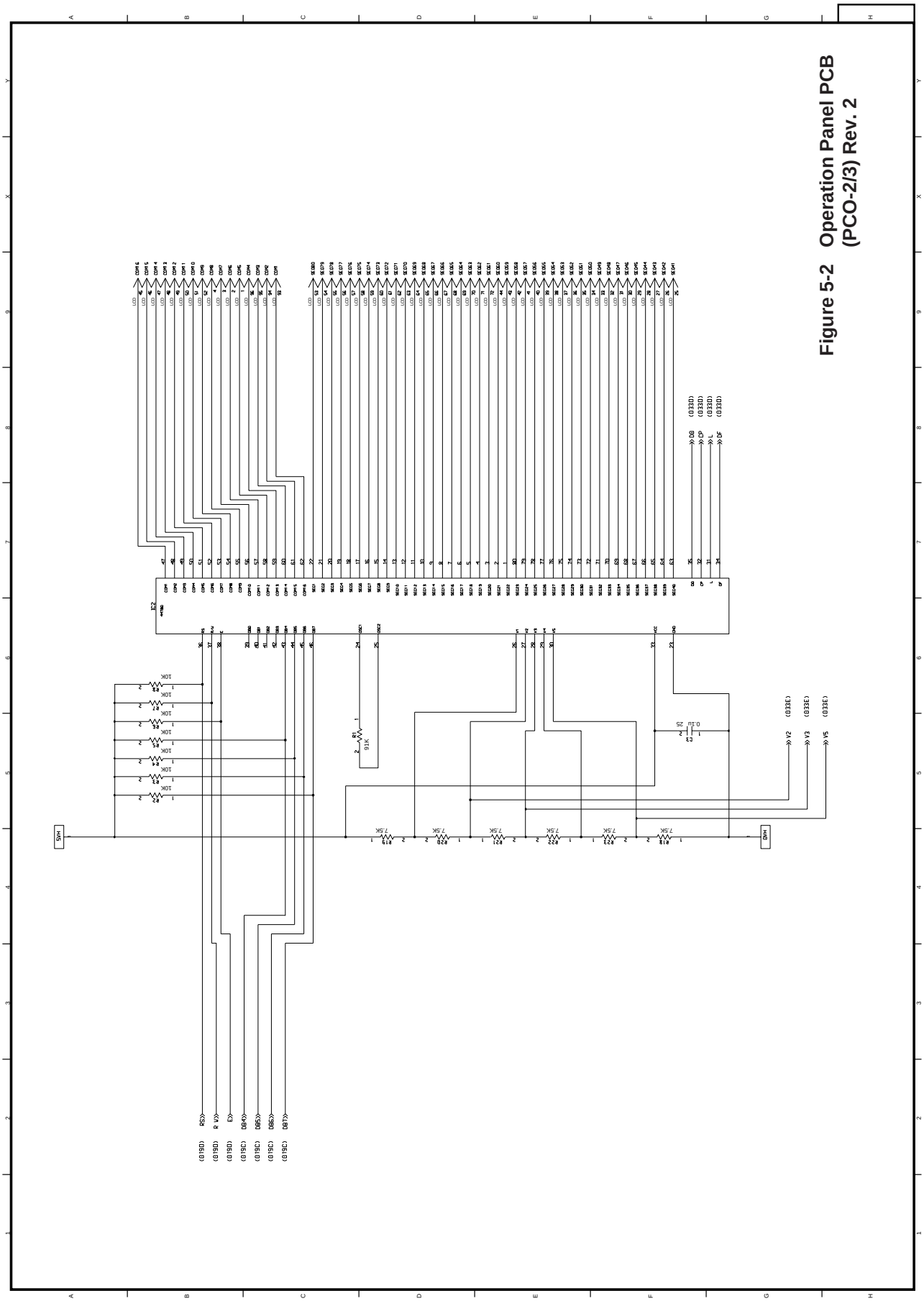


Figure 5-2 Operation Panel PCB (PCO-2/3) Rev. 2

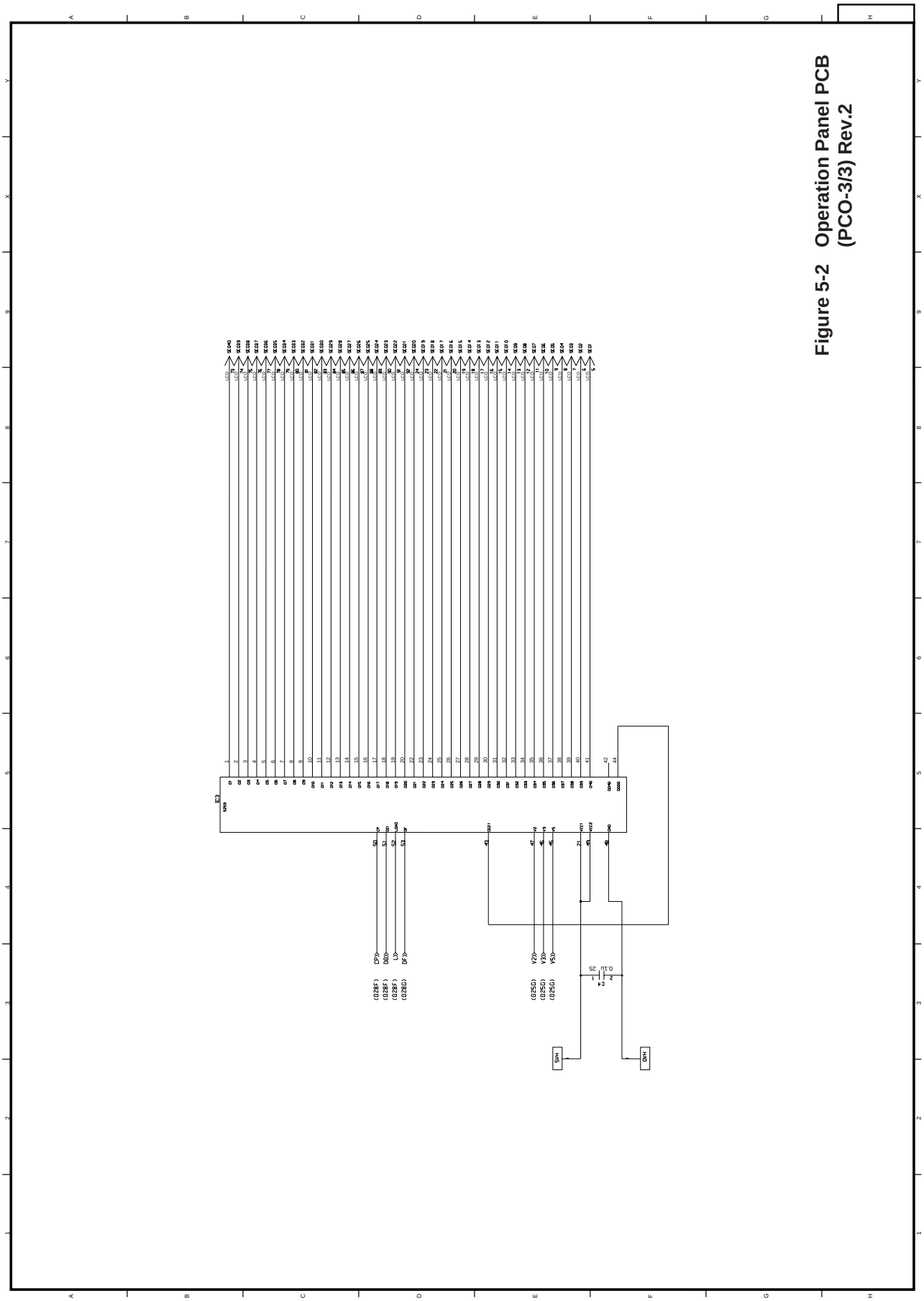


Figure 5-2 Operation Panel PCB (PCO-3/3) Rev.2

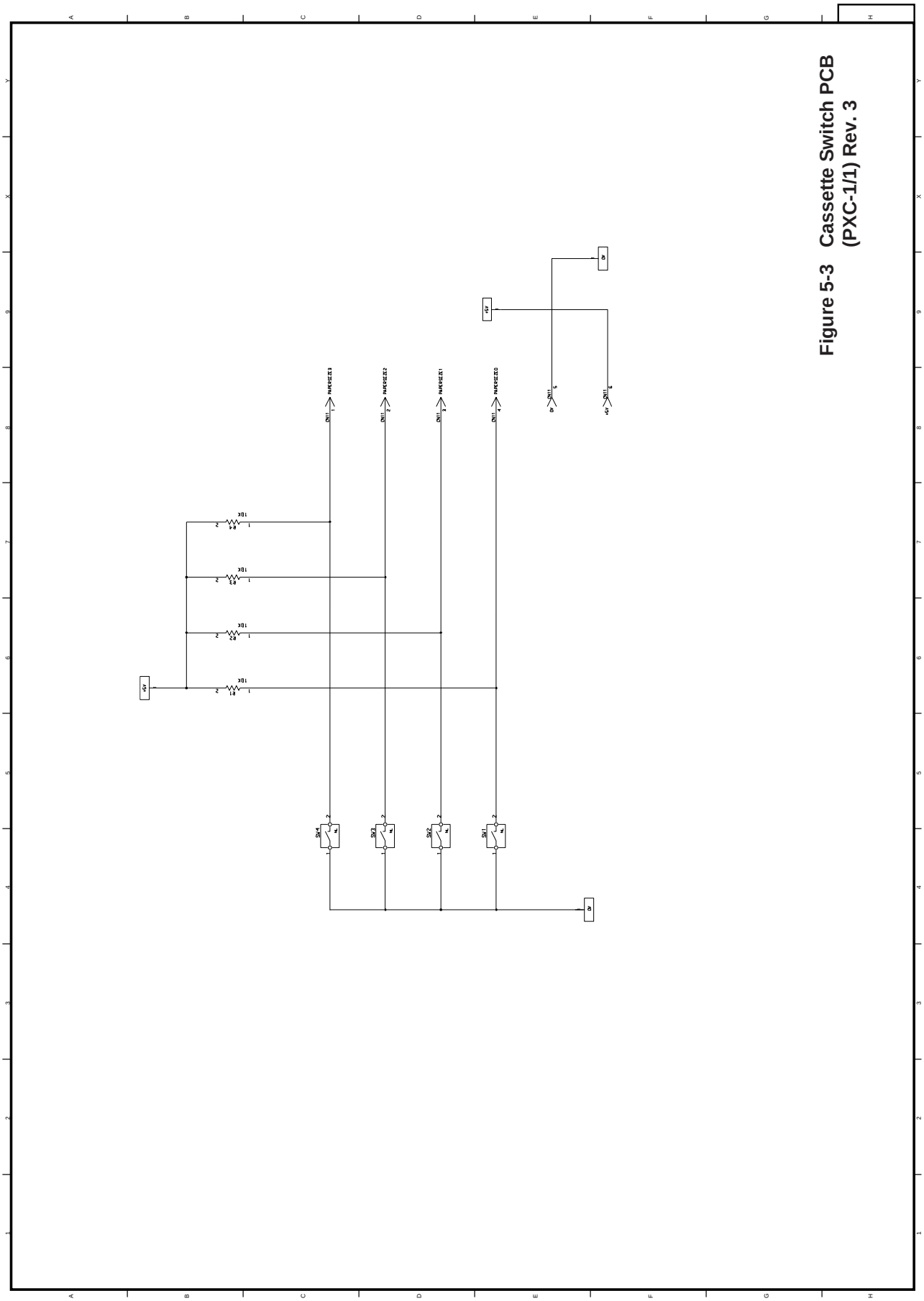
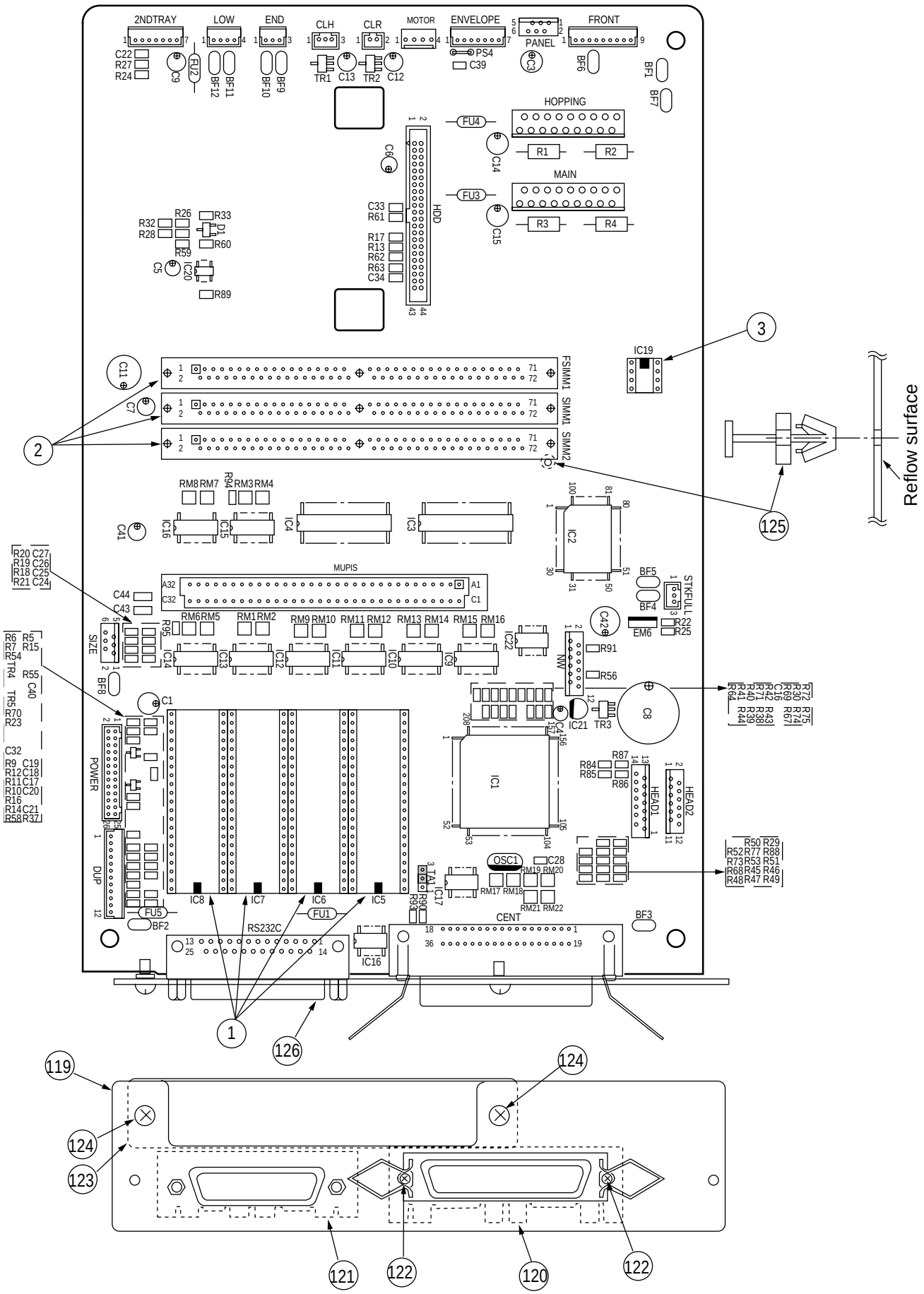


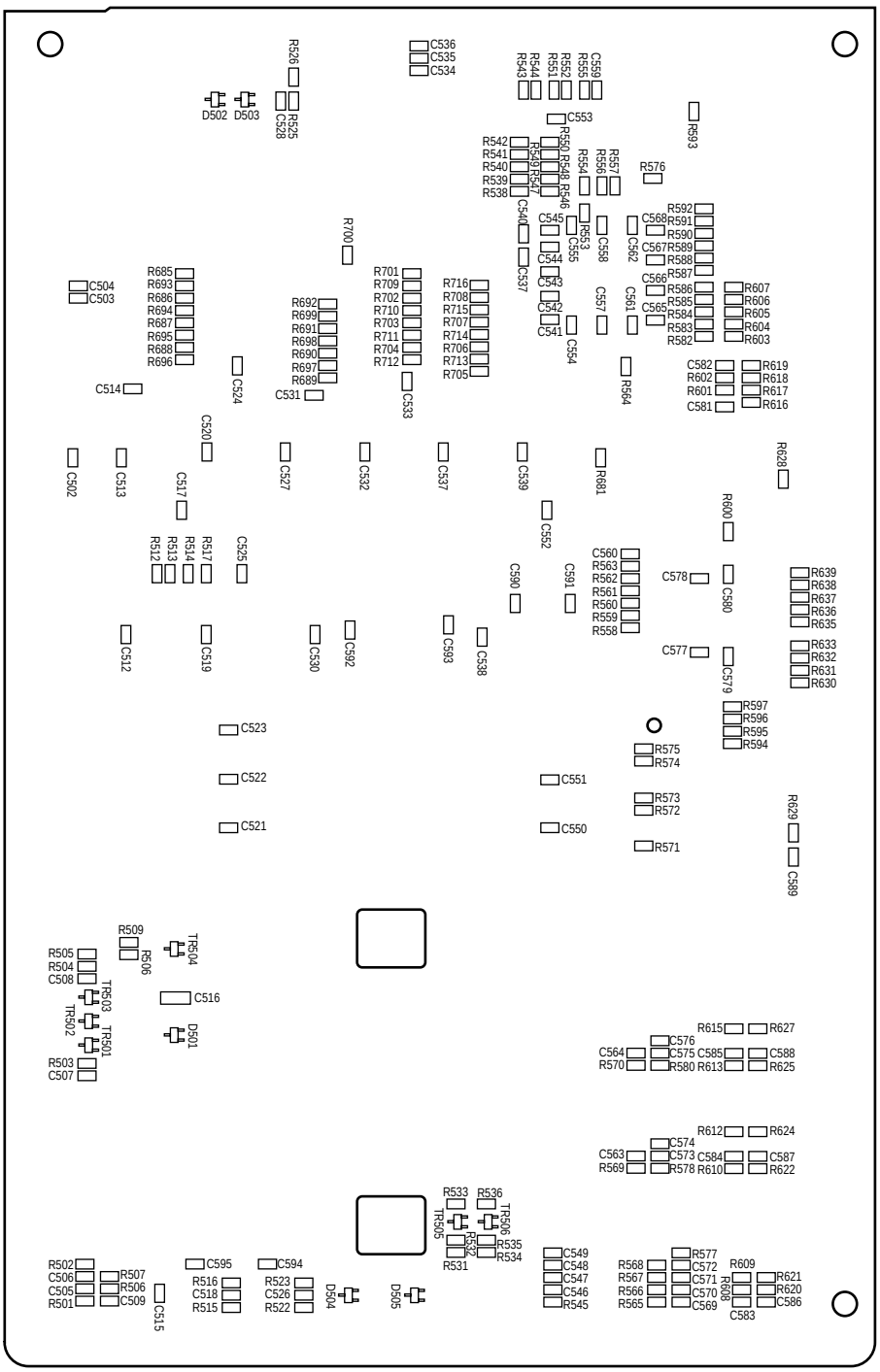
Figure 5-3 Cassette Switch PCB (PXC-1/1) Rev. 3

6. COMPONENT PARTS LIST

Main Controller PCB	(AAA-PCB, Rev.4)	40285702
Operation Panel PCB	(PCO-PCB, Rev.2)	
Cassette Switch PCB	(PXC-PCB, Rev.3)	40368602



Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 1/10)



Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 2/10)

Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 3/10)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1		DICF-42CS-E IC Socket	245A1221P0420	4	
2		2-176438-7 IC Socket	245A1372P0720	3	
3		DICF-8CS-E IC Socket	245A1221P0080	1	
4					
5	D502	SS100MA80VACP Signal DI (CP)	611A0000N0001	1	
6	D501,D503	SS100MA80VKCP Signal DI (CP)	611A0000N0002	2	
7	D504,D505	MA151WK/N202K/2838 Signal DI (CP)	611A0003N0003	2	
8	D1	RD4.3M-B3 Zener DI	613A0233M0092C	1	
9					
10	R557	RM73B2A105F RN Resistor (CP)	323A5003F0105	1	
11	R612,R615	RM73B2A201F RN Resistor (CP)	323A5003F0201	2	
12	R556	RM73B2A221F RN Resistor (CP)	323A5003F0221	1	
13	R627	RM73B2A272F RN Resistor (CP)	323A5003F0272	1	
14	R616~R619	RM73B2A301F RN Resistor (CP)	323A5003F0301	4	
15	R601,R624	RM73B2A331F RN Resistor (CP)	323A5003F0331	2	
16	R602	RM73B2A911F RN Resistor (CP)	323A5003F0911	1	
17	R5~R7,R9~R15,R95, R554,R593,R685~R716	RM73B2A101J RN Resistor (CP)	323A5003J0101	45	

Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 4/10)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
18	R16~R22,R506,R516, R523,R533,R536,R555, R568~R570,R576,R609, R621,R622,R625,R628	RM73B2A102J RN Resistor (CP)	323A5003J0102	22	
19	R23,R24,R543,R552, R608,R620	RM73B2A103J RN Resistor (CP)	323A5003J0103	6	
20	R542,R566,R567	RM73B2A122J RN Resistor (CP)	323A5003J0122	3	
21	R25,R505,R629	RM73B2A153J RN Resistor (CP)	323A5003J0153	3	
22	R504	RM73B2A182J RN Resistor (CP)	323A5003J0182	1	
23	R94,R502	RM73B2A201J RN Resistor (CP)	323A5003J0201	2	
24	R74,R603,R604,R606	RM73B2A202J RN Resistor (CP)	323A5003J0202	4	
25	R26	RM73B2A222J RN Resistor (CP)	323A5003J0222	1	
26	R27	RM73B2A241J RN Resistor (CP)	323A5003J0241	1	
27	R28	RM73B2A244J RN Resistor (CP)	323A5003J0244	1	
28	R537	RM73B2A270J RN Resistor (CP)	323A5003J0270	1	
29	R29,R30,R503,R507, R577,R582,R584	RM73B2A272J RN Resistor (CP)	323A5003J0272	7	
30	R515,R522	RM73B2A303J RN Resistor (CP)	323A5003J0303	2	
31	R93,R508,R509,R525, R526,R544,R551	RM73B2A332J RN Resistor (CP)	323A5003J0332	7	
32	R578,R580,R610,R613	RM73B2A333J RN Resistor (CP)	323A5003J0333	4	
33	R531,R532,R534,R535	RM73B2A392J RN Resistor (CP)	323A5003J0392	4	

Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 5/10)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
34	R32	RM73B2A431J RN Resistor (CP)	323A5003J0431	1	
35	R33	RM73B2A432J RN Resistor (CP)	323A5003J0432	1	
36	R565	RM73B2A471J RN Resistor (CP)	323A5003J0471	1	
37	R37,R39,R41,R45~R53, R501,R545,R560~R563, R586,R594,R600,R631 ~R633,R635~R639,R681	RM73B2A510J RN Resistor (CP)	323A5003J0510	30	
38	R54~R56,R58~R64,R67~ R73,R75,R77,R91,R512~ R514,R517,R553,R558, R559,R564,R571~R575, R583,R585,R595~R597, R605,R607,R630	RM73B2A512J RN Resistor (CP)	323A5003J0512	41	
39	R84~R87,R587~R592	RM73B2A560J RN Resistor (CP)	323A5003J0560	10	
40	R88	RM73B2A561J RN Resistor (CP)	323A5003J0561	1	
41	R89	RM73B2A683J RN Resistor (CP)	323A5003J0683	1	
42	R38,R40,R42~R44,R90, R538~R541,R546~R550	2125JPW Tip Jumper (CP)	323A5003P0001	15	
43	R1~R4	MSF1/2B0.51ΩJ RS Resistor	324A1001J0518	4	
44					
45	RM21,RM22	MNR14E0ABJ220 Resistor-Block -C	3345000J0220	2	
46	RM1~RM7	MNR14E0ABJ330 Resistor-Block -C	3345000J0330	7	
47	RM8~RM16	MNR14ABJ101 Block Resistor (CP)	334A5012J0101	9	
48	RM17~RM20	MNR14ABJ332 Block Resistor (CP)	334A5012J0332	4	

Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 6/10)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
49					
50	C16,C517,C560	CC2012CH1H101J 50V CC Capacitor (CP)	303A3007C0101	3	
51	C17~C22,C505,C506, C546~C548	CC2012CH1H330J 50V CC Capacitor (CP)	303A3007C0330	11	
52	C509,C518,C526,C549, C569~C572	CC2012CH1H680J 50V CC Capacitor (CP)	303A3007C0680	8	
53	C559,C563,C564,C573, C575,C583~C588	CC2012SL1H102J 50V CC Capacitor (CP)	303A3007K0102	11	
54	C24~C28	CC2012SL1H561J 50V CC Capacitor (CP)	303A3007K0561	5	
55	C528	CC2012SL1H681J 50V CC Capacitor (CP)	303A3007K0681	1	
56	C29	CK92F1E155ZS 25V CK Capacitor 1.5μF	303A4117Z2155	1	
57	C541,C555,C565,C568	CK2012B1H102K 50V CK Capacitor (CP)	303A6008K3102	4	
58	C507,C540,C543,C581	CK2012F1C105Z 16V CK Capacitor (CP) 1μF	303A6008Z1105	4	
59	C32~C34,C39,C40,C502 ~C504,C512~C515,C519~ C525,C527,C530~C533, C537~C539,C542,C544, C545,C550~C554,C557, C558,C561,C562,C566, C567,C589~C595	CK2012F1E104Z 25V CK Capacitor (CP)	303A6008Z2104	48	
60	C35	CK2012F1E224Z 25V CK Capacitor (CP)	303A6008Z2224	1	
61	C582	CK2012F1H103Z 50V CK Capacitor (CP)	303A6008Z3103	1	
62	C508,C534~C536,C574, C576~C580	CK2012F1H104Z 50V CK Capacitor (CP)	303A6008Z3104	10	
63	C43,C44,C516	CK3216B1H104K 50V CK Capacitor (CP)	303A6009K3104	3	

Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 7/10)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
64					
65	C1,C42	URS1C221MNA1FA 16V CE Capacitor 220µF	304A1007C1221	2	
66	C3	10MS5-68M 10V CE Capacitor 68µF	304A1046A1680	1	
67	C4~C6	16MS5-10M 16V CE Capacitor 10µF	304A1046C1100	3	
68	C8	UVS1A332MHA 10V CE Capacitor 3300µF	304A1137A1332	1	
69	C11	SME50VB-220-CC 50V CE Capacitor 220µF	304A1165H1221	1	
70	C7,C41	KMG10VB-100M-FC 10V CE Capacitor 100µF	304A1180H1101	2	
71	C9,C12,C13	KMG50VB-10M-FC 50V CE Capacitor 10µF	304A1180H1100	3	
72	C14,C15	KMG50VB-47M-FC 50V CE Capacitor 47µF	304A1180H1470	2	
73					
74	IC1	MHM2029-003K-41 Micro Computer-MOS -F	8510440N0004	1	
75	IC2	LZ9FF22 Digital IC-MOS -F	7024631N2001	1	
76	IC17	74LS07FP BIP Digital IC (S0)	700A0503N0007	1	
77	IC22	SN74LS00NS BIP Digital IC (S0)	700A0550N0000	1	
78	IC13~IC16	SN74ALS244CNS BIP Digital IC (S0)	700A2550N0244B	4	
79	IC9~IC12	74ALS245AFP BIP Digital IC (S0)	700A2503N0245	4	
80	IC18	SN75188NS BIP-INF-IC (S0)	710A0050N0188	1	

Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 8/10)

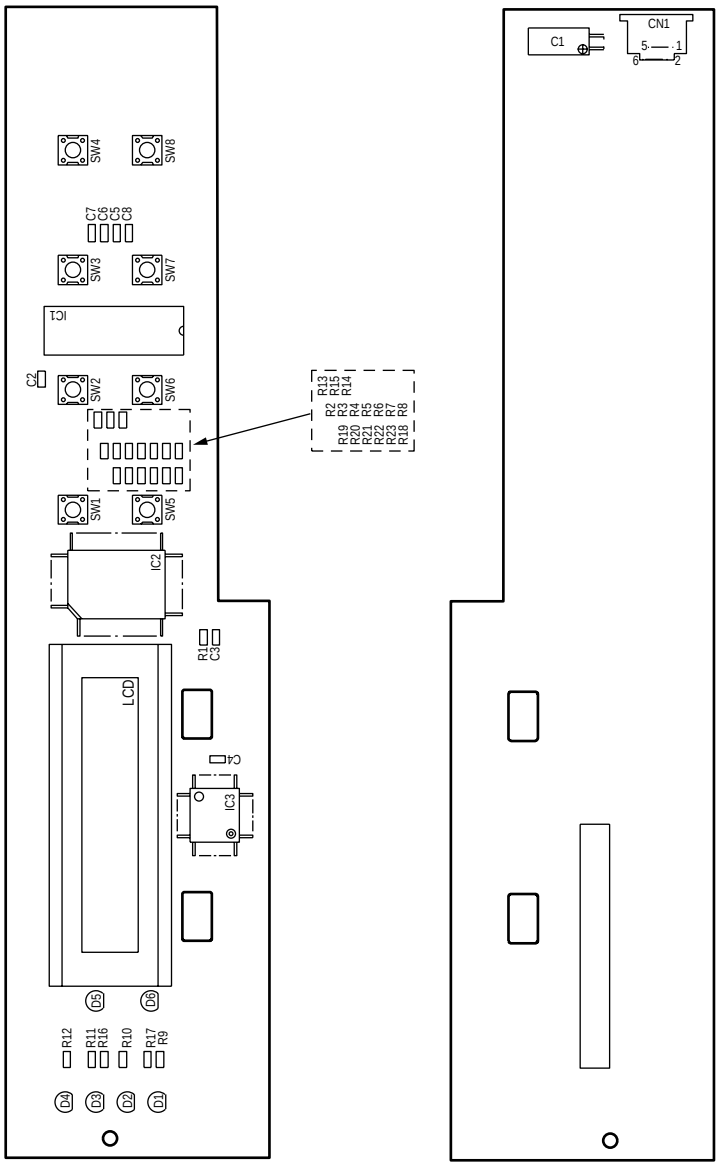
REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
81	IC21	TL431CLP/NJM431L-T3 Analog IC-BIP Linear -P	7200903M9001	1	
82	IC20	UPC393G2 BIP Linear IC (S0)	720A0523N0011	1	
83	HOPPING,MAIN	A2918SWV BIP Linear IC	720A1826M0004	2	
84	IC3,IC4	5118160JP-60 Memory IC-MOSDRAM -S	8020003N4613	2	
85	IC19	NM93C46LN-NW Memory IC-MOSEEPR -	8160339M0000	1	
86					
87	EM8	ZJSC-R47-181 EMI Filter	342A1012P1181	1	
88					
89	TR5,TR501,TR502	A1344/UN2111/DTA114K PNP-HF-TR (CP)	600A1003N0003	3	
90	TR1,TR2	2SA1417S/T PNP-HF-TR (CP)	600A1032N0011	2	
91	TR4,TR503,TR504	DTC114EKA NPN-HF-TR (CP)	602A1035N0005	3	
92	TR505,TR506	DTC123YK NPN-HF-TR (CP)	602A1035N0019	2	
93	TR3	2SD1623S NPN-LF-TR (CP)	603A1132N0001S	1	
94					
95	CENT	57RE-40360-830B-D29 Rectangular Connector	2201001P0360	1	
96	RS232C	17LE-13250-27(D4CC) Rectangular Connector	220A1448P0250	1	
97	HDD	A3E-44PA-2DSA PC Connector	2241001P0440	1	

Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 9/10)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
98	POWER	B26B-PHDSS PC Connector	2243004P0260	1	
99	END	175487-3 PC Connector	2244005P0030	1	
100	LOW	175487-4 PC Connector	2244005P0040	1	
101	PANEL,SIZE	06FE-BT-VK-N PC Connector	2244102P0060	2	
102	NW,HEAD2	12FE-BT-VK-N PC Connector	2244102P0120	2	
103	HEAD1	14FE-BT-VK-N PC Connector	2244102P0140	1	
104	MOTOR	00-8263-0412-00-000 PC Connector	224A3357P0040	1	
105	CLR	B2B-PH-K-S PC Connector	224A3529P0020	1	
106	CLH,STKFULL	B3B-PH-K-S PC Connector	224A3529P0030	2	
107	MUPIS	00-8345-396-949-014 PC Connector	224A3618P0640	1	
108	TA1	IMSA9202B-1-03Z013GF PC Connector	224A4082P0030	1	
109	2NDTRAY,ENVELOPE	175487-7 PC Connector	224A4322P0070	2	
110	FRONT	175487-9 PC Connector	224A4322P0090	1	
111	DUP	1-175487-2 PC Connector	224A4322P0120	1	
112					
113	OSC1	CST10.1MTW042-TF01 Ceramic Oscillator -P	3811000B0002	1	
114	BF1~BF12,PS14	ZBF253D-01 Beads Filter	377A1115P1309	13	

Main Controller PCB (AAA-PCB) Rev. 4
(40285702 - 10/10)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
115	FU1~FU4	251-001 Fuse	540A2208S1102	4	
116	FU5	Z01/4W Resistor-0Ω-Q	3251503P0001	1	
117					
118					
119		Plate Panel	40323601	1	
120		Earth Plate (A)	PP4128-1131P001	1	
121		Earth Plate (B)	PP4128-1132P001	1	
122		Screw	P3-6G	2	
123		Plate-Blind	40442801	1	
124		Screw	PSW2W3-6C	2	
125		MPS-04-0 Card Spacer	143A1047P0001	1	
126		IMSA-9206H-GF PC Connector	224A4080P0020	1	



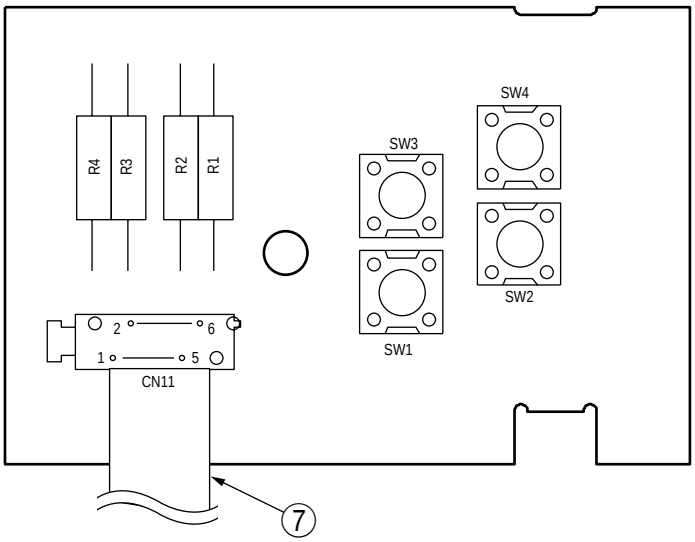
Operation Panel PCB(PCO-PCB) Rev.2
(- 1/3)

Operation Panel PCB(PCO-PCB) Rev.3
(- 2/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1	SW1~SW8	SOR113-HS Push Button Switch	205A1165P1000	8	
2					
3					
4	C5~C8	CC2012CH1H101J 50V CC Capacitor (CP)	303A3007C0101	4	
5	C2~C4	CK2012F1E104Z 25V CK Capacitor (CP)	303A6008Z2104	3	
6	C1	KME10VB-100 10V CE Capacitor 100μF	304A1115A1101	1	
7					
8	R1	RM73B2A913F RN Resistor (CP)	323A5003F0913	1	
9	R2~R8	RM73B2A103J RN Resistor (CP)	323A5003J0103	7	
10	R9~R17	RM73B2A201J RN Resistor (CP)	323A5003J0201	9	
11	R18	RM73B2A512J RN Resistor (CP)	323A5003J0512	1	
12	R19~R23	RM73B2A752J RN Resistor (CP)	323A5003J0752	5	
13					
14	D6	SEL3210R-YZ LED	650A0129M0016	1	
15	D5	SEL3610D-YZ LED	650A0229M0018	1	
16					
17	IC1	BU6152S MOS Digital IC	702A4733M0002	1	

Operation Panel PCB(PCO-PCB) Rev.3
(- 3/3)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
18	IC2	HD44780UB01FS CPU-INF-IC (FP)	855A0421N0002	1	
19	IC3	MSM5259GS-2K CPU-INF-IC (FP)	855A0024N0001	1	
20					
21	CN1	06FE-ST-VK-N Connector-PCB	2244101P0060	1	



Cassette Switch PCB(PXC-PCB) Rev.3
(40368602 - 1/2)

Cassette Switch PCB(PXC-PCB) Rev.6
(40368602 - 2/2)

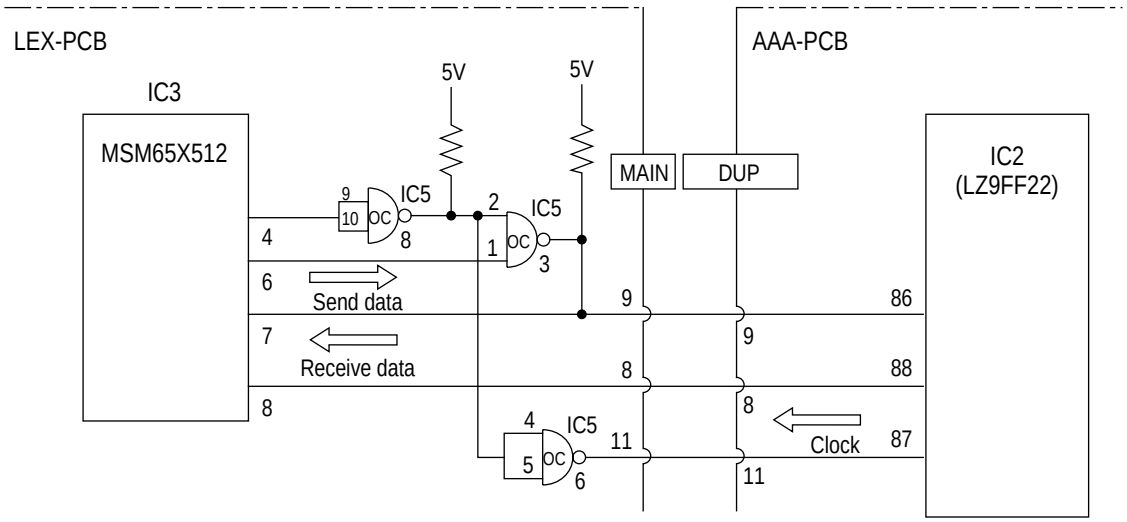
REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1	SW1~SW4	SOR-113HS Push Button Switch	205A1165P1000	4	
2					
3	CN11	00-5062-301-006-000 PC Connector	224A5114P0060	1	
4					
5	R1~R4	RD1/4Y10KΩJ RD Resistor (CP)	321A1421J0103	4	
6					
7		SMCD6X370ESX10(BL) Connector	2381007P0002	1	
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

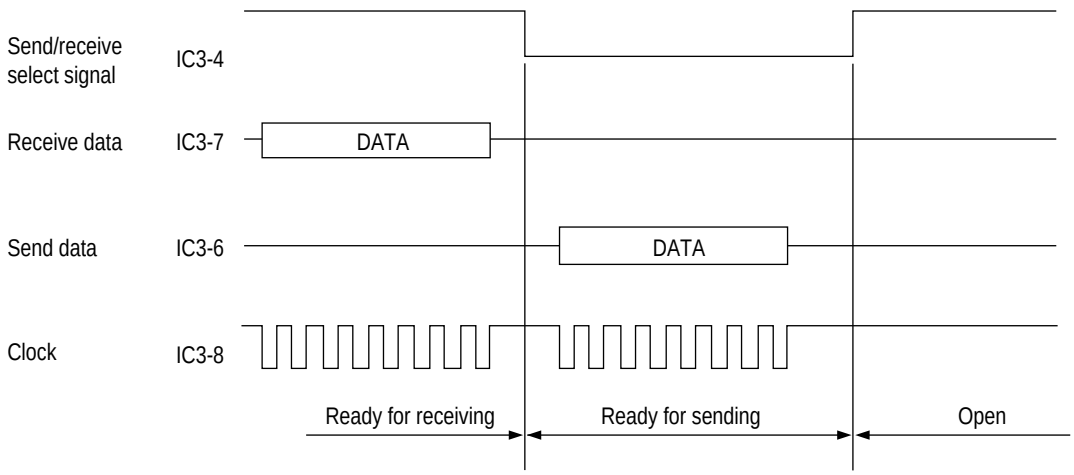
APPENDIX A DUPLEX UNIT (OPTION)

1. CIRCUIT DESCRIPTION

1.1 Interface

IC3 (MSM65X512) uses a single line for transferring data to and from the CPU on the main unit side by performing the switchover between sending and receiving. To receive data from the CPU on the main unit side, IC3 (MSM65X512) causes the send/receive select signal at pin 4 of IC3 to be HIGH in order to drive the open collector output (pin 3 of IC5) to the high impedance state. As a result, the line in the send direction is open and the receive data ready state is established. To send data to the CPU on the main unit side, IC3 causes the send/receive select signal (pin 4 of IC3) to be LOW, so that the send data ready state can be established. Under this condition, IC3 can send out data through pin 6. When finishing data transmission, IC3 causes the send/receive select signal (pin 4 of IC3) to be HIGH to open the send direction of the line.

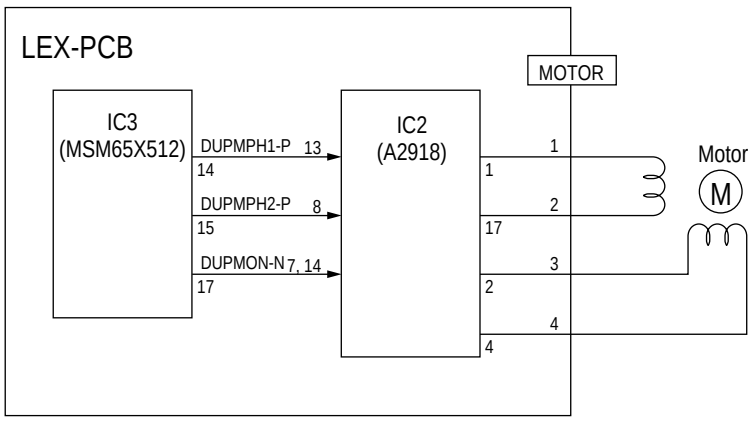


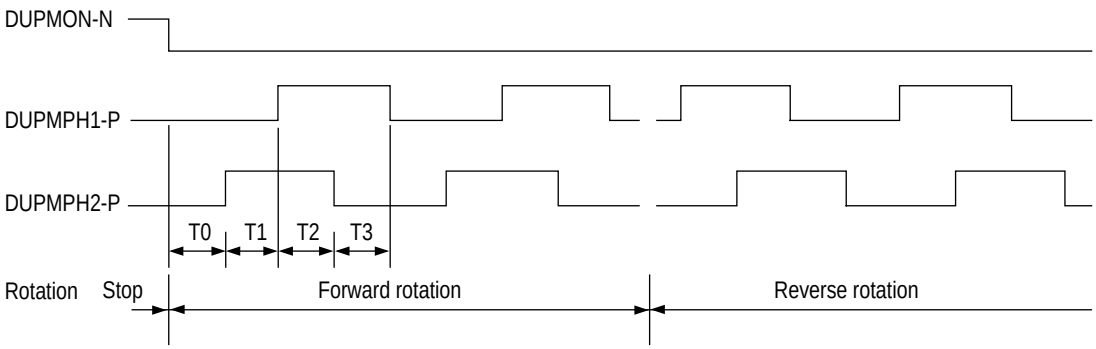


1.2 Motor Control

Duplex unit controls the paper flow by one motor, one clutch and one solenoid.

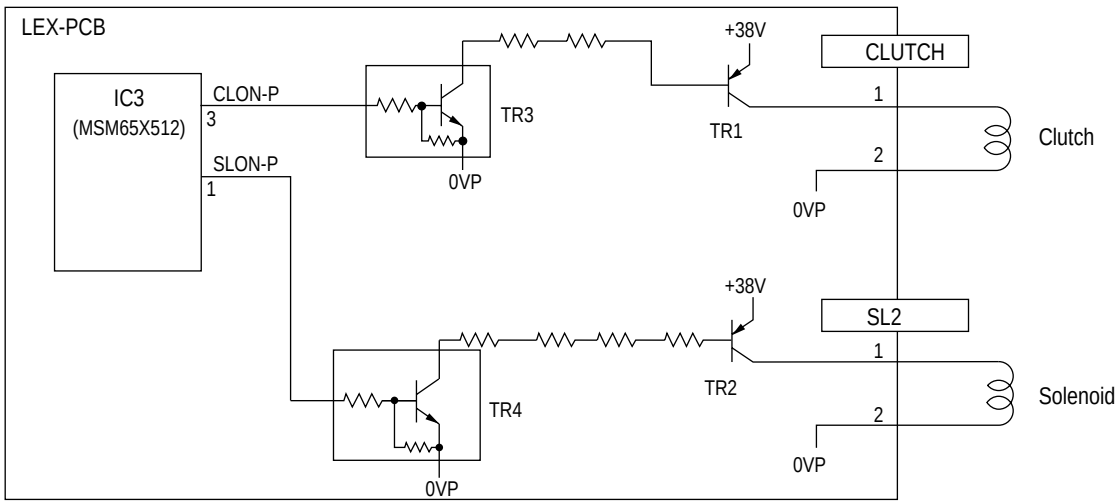
(1) Motor
The motor is driven by the driver IC according to the control signal from the IC3 (MSM65X512).





Operation at normal speed: T0 to T3 = 918 μs

(2) Clutch and solenoid
Clutch and solenoid are driven by the driver IC according to the control signal from the IC 3 (MSM65X512).



2. TROUBLESHOOTING

2.1 Troubleshooting Table

(A) Control board (LEX-PCB)

Failure	LCD Message	Flowchart No.
DUPLEX INPUT JAM occurs.	DUPLEX INPUT JAM REMOVE THE PAPER	A - 1
DUPLEX FEED JAM1 occurs.	DUPLEX FEED JAM1 REMOVE THE PAPER	A - 2
DUPLEX FEED JAM2 occurs.	DUPLEX FEED JAM2 REMOVE THE PAPER	A - 3
DUPLEX FEED JAM3 occurs.	DUPLEX FEED JAM3 REMOVE THE PAPER	A - 4
DUPLEX I/F timeout error occurs.	ERROR 83	A - 5

2.2 Troubleshooting Flowchart

A-1 Duplex input JAM occurs

- Are papers normally fed to the Duplex unit?
  - No — Are the Paper sensor signals normally input to the 2 pin of the IC3(MSM65X512)?
    - No — Does the connector (MAIN) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time)
      - No — Replace the connector (MAIN).
    - Yes — Does the signal (SLON-P) at the 1 pin of the IC3 (MSM65X512) change to High level.
      - No — Replace IC3 (MSM65X512)
    - Yes — Does the 3 pin of the TR2 change to Low level?
      - No — Replace TR4.
    - Yes — Does the 2 pin of the TR2 change to High level (+38V)?
      - No — Replace TR2.
    - Yes — Does the connector (SL2) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time)
      - No — Replace the connector (SL2).
    - Yes — Failure of solenoid
  - Yes — Is the Duplex In sensor signal normally input to the 12 pin of the IC3 (MSM65X512).
    - Yes — Replace IC3 (MSM65X512)
  - No — Does the connector (INSENS) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time)
    - No — Replace the connector (INSENS).
  - Yes — Failure of Duplex In sensor or Connection Code-Wire

A-2 Duplex feed JAM1 occurs

- Is the Duplex motor rotating after a paper is fed to the Duplex unit?
  - No — Is the Outlet sensor signal normally input to the 10 pin of the IC3 (MSM65X512)?
    - Yes — Does the connector (MAIN) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time.)
      - No — Replace the connector (MAIN).
  - Yes — Are the normal waveforms as shown in section 1.2 output to pins 14, 15 and 17 of IC (MSM65X512)?
    - No — Replace IC3 (MSM65X512).
  - Yes — Does the connector (MOTOR) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time.)
    - No — Replace the connector (MOTOR).
  - Yes — Replace IC2 (A2918).
  - OK? — Yes end
  - No — Failure of motor or mechanical parts
- Yes — Is the Duplex In sensor signal normally input to the 12 pin of the IC3 (MSM65X512)?
  - Yes — Replace IC3 (MSM65X512)
- No — Does the connector (INSENS) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time.)
  - No — Replace the connector (INSENS)
- Yes — Failure of Duplex In sensor or Connection Code-Wire

A-3 Duplex feed JAM2 occurs

- Can a paper reach the Duplex Rear sensor?
  - No — Does the signal (CLON-P) at the 3 pin of IC3 (MSM65X512) change to High level?
    - • No — Replace IC3 (MSM65X512)
  - Yes — Does the 3 pin of the TR1 change to Low level?
    - • No — Replace TR3.
  - Yes — Does the 2 pin of the TR1 change to High level (+38V)?
    - • No — Replace TR1.
  - Yes — Does the connector (CLUTCH) have any trouble? (Carry out a connection check towards the connection cord and connector at the same time.)
    - • No — Replace the connector (CLUTCH).
  - Yes — Failure of mechanical parts
- Yes — Is the Duplex Rear sensor signal normally input to the 11 pin of the IC3 (MSM65X512)?
  - • Yes — Replace IC3 (MSM65X512).
- No — Replace SENSOR.

A-4 Duplex feed JAM3 occurs

- Can a paper reach the Duplex Front sensor?
  - No — Does the signal (CLON-P) at the 3 pin of the IC3 (MSM65X512) change to High level?
    - • No — Replace IC3(MSM65X512).
  - Yes — Does the 3 pin of the TRI change to Low level
    - • No — Replace TR3.
  - Yes — Does the 2 pin of the TRI change to High level (+38V)?
    - • No — Replace TR1.
  - Yes — Does the connector (CLUTCH) have any trouble?
    (Carry out a connection check towards the connection cord and connector at the same time.)
    - • No — Replace the connector (CLUTCH).
  - Yes — Failure of mechanical parts
- Yes — Is the Duplex Front sensor signal input to the 13 pin of the IC3 (MSM65X512)?
  - • Yes — Replace IC3 (MSM65X512).
- Yes — Does the connector (FSENS) have any trouble?
  (Carry out a connection check towards the connection cord and connector at the same time.)
  - • No — Replace the connector (FSENS)
- Yes — Failure of Duplex Front sensor or Connection Code-Wire

A-5 Duplex I/F timeout error occurs (ERROR 83)

- Does the connector (MAIN) have any trouble?
  (Carry out a connection check towards the connection cord and connector at the same time.)
  - • No — Replace the connector (MAIN).
- Yes — Replace IC3 (MSM65X512)
- OK? — Yes end
- No — Replace IC5 (LS38).

3. CIRCUIT DIAGRAM

Figure 3-1(1/3~3/3) Duplex control-PCB (LEX-PCB, Rev. 2)

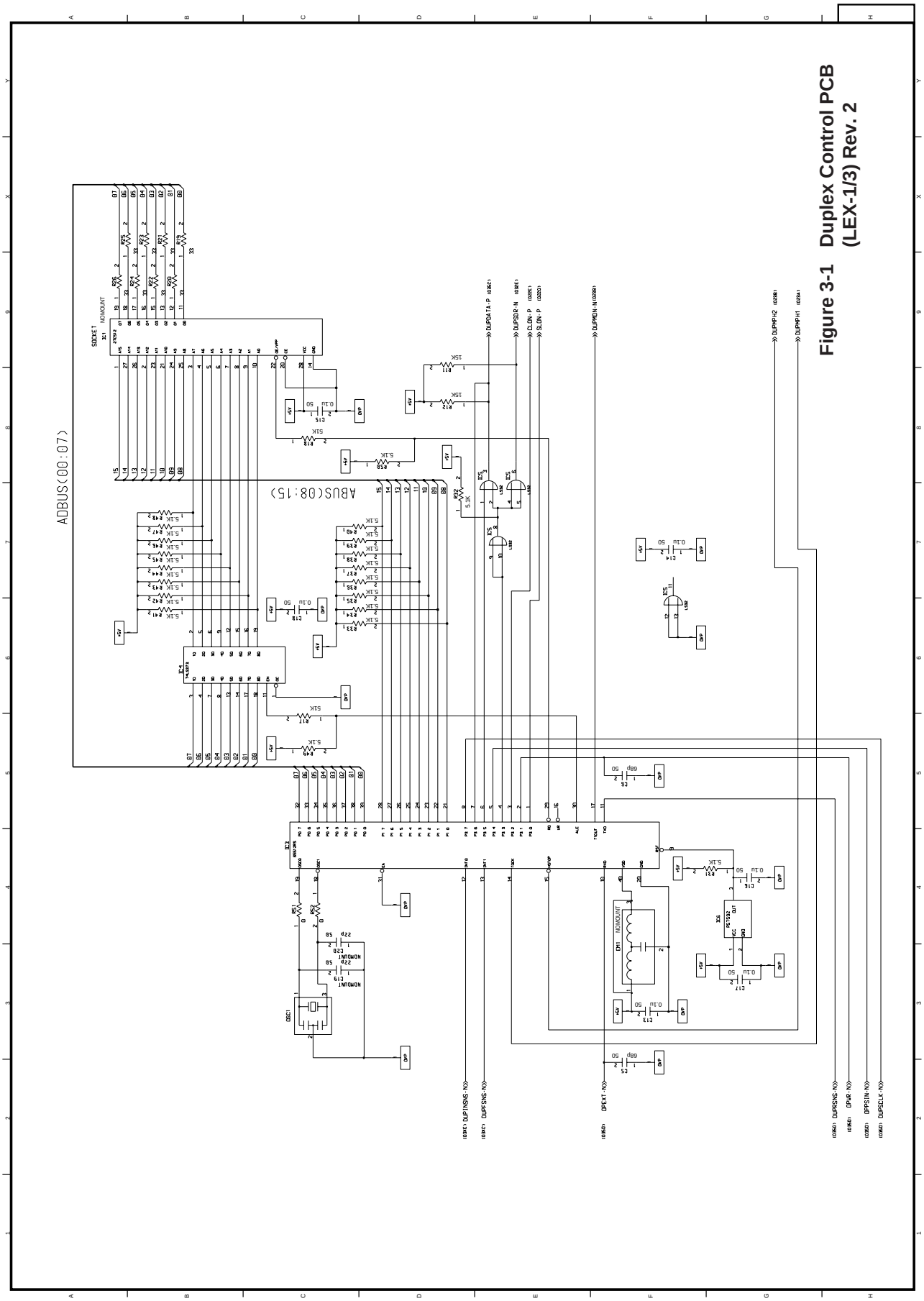


Figure 3-1 Duplex Control PCB (LEX-1/3) Rev. 2

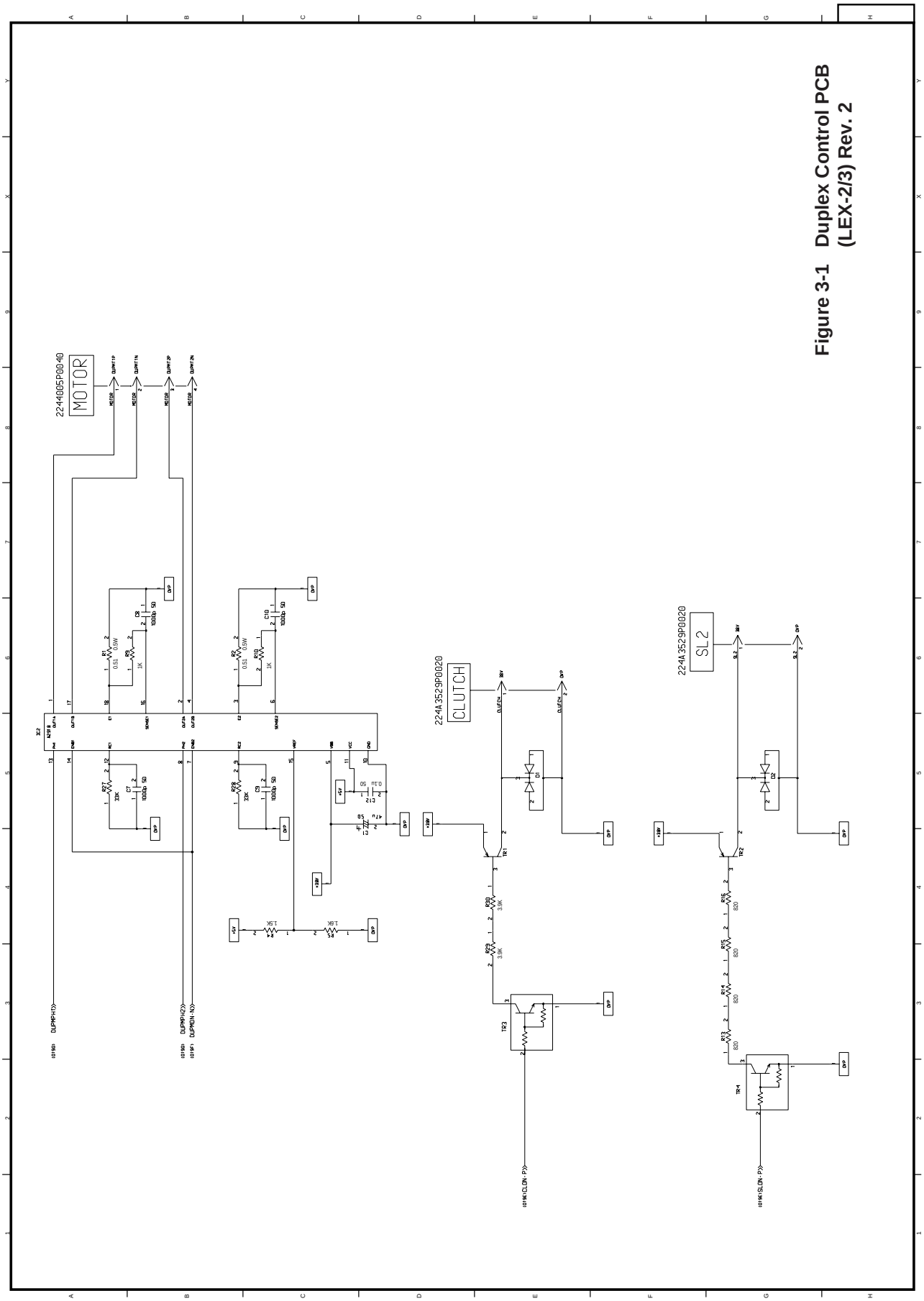


Figure 3-1 Duplex Control PCB (LEX-2/3) Rev. 2

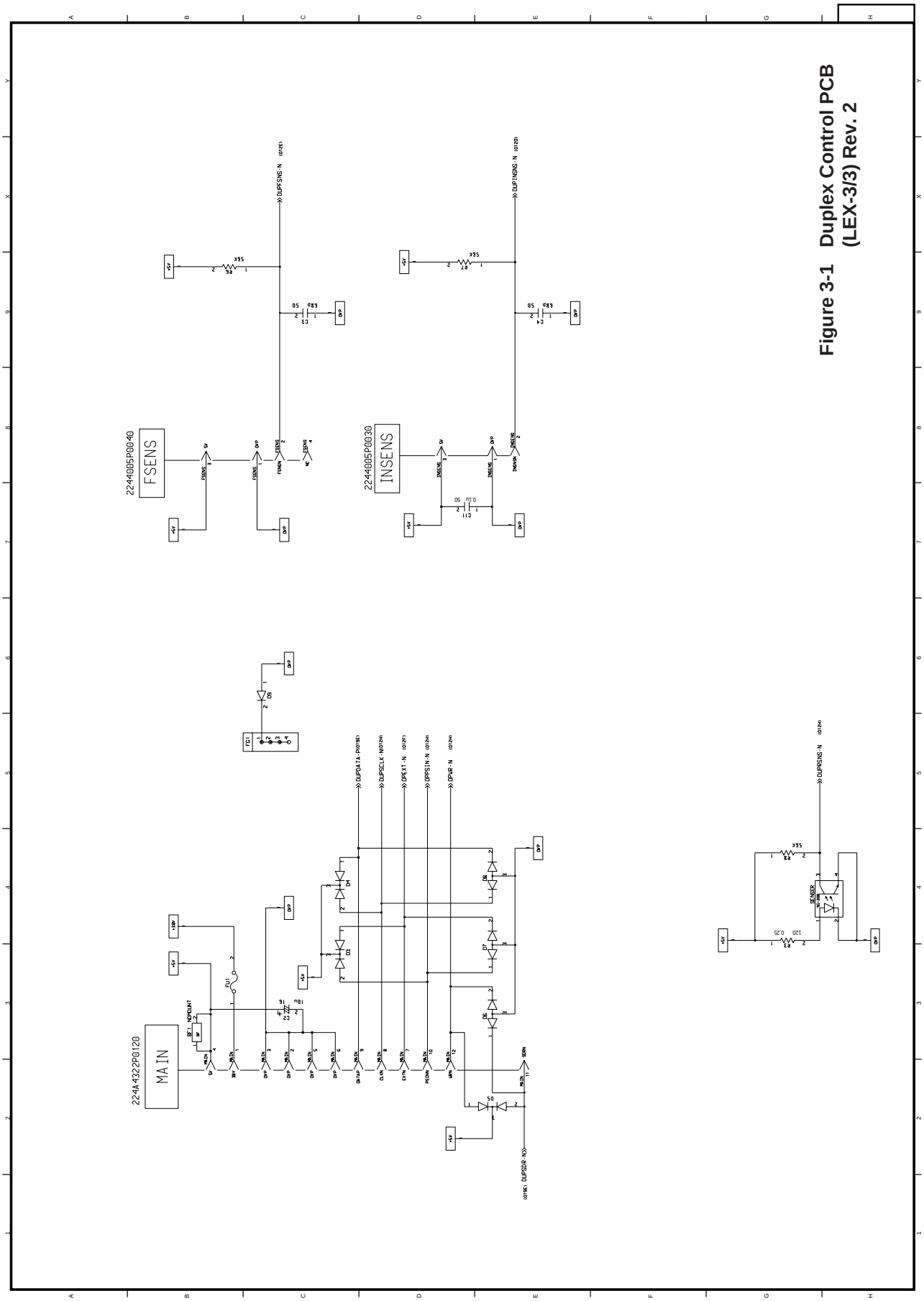
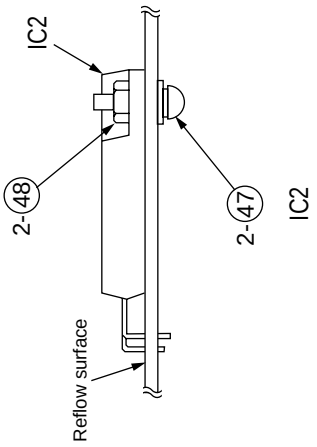
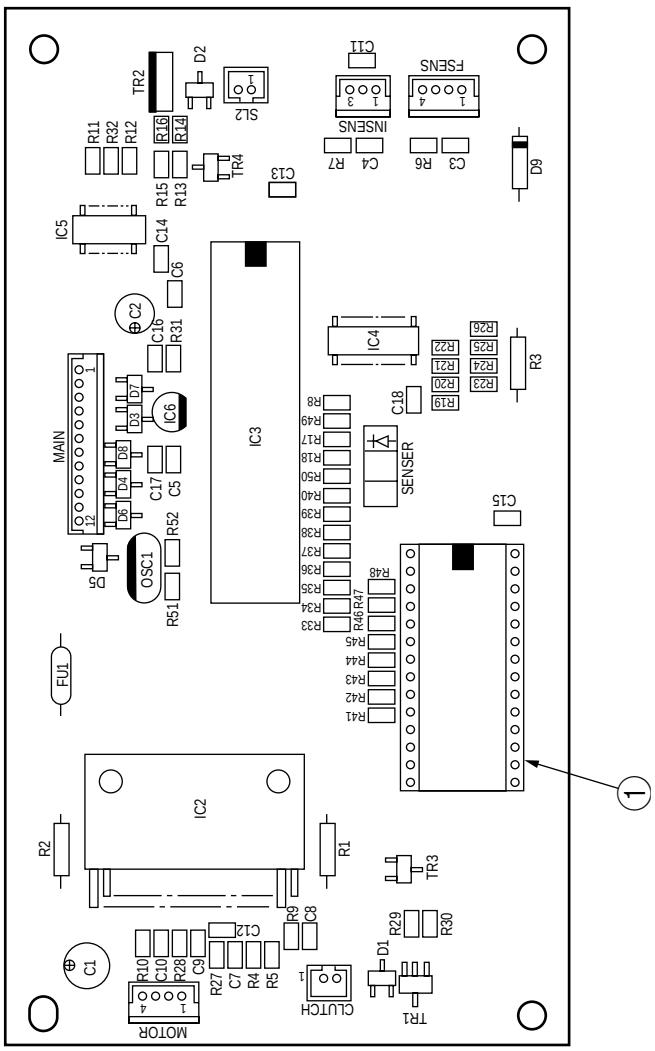


Figure 3-1 Duplex Control PCB (LEX-3/3) Rev. 2

4. COMPONENT PARTS LIST

Duplex control-PCB	(LEX-PCB, Rev.2)	40495802





Duplex Control PCB (LEX-PCB) Rev. 2
(40495802 - 1/4)

Duplex Control PCB (LEX-PCB) Rev. 2
(40495802 - 2/4)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1		DICF-28CS-E IC Socket	245A1221P0280	1	
2					
3	D1,D2	MA151WK/N202K/2838 Signal DI (CP)	611A0003N0003	2	
4	D6~D8	SS100MA80VACP Signal DI (CP)	611A000DN0001	3	
5	D3~D5	SS100MA80VKCP Signal DI (CP)	611A0000N0002	3	
6	D9	OR-Rectifying DI -Q	40401401	1	
7					
8	R1,R2	MSF1/2B0.51ΩJ RS Resistor	324A1001J0518	2	
9	R3	RD1/4Y120ΩJ RD Resistor	321A1421J0121	1	
10	R4	RM73B2A152F RN Resistor (CP)	323A5003F0152	1	
11	R5	RM73B2A162F RN Resistor (CP)	323A5003F0162	1	
12	R6~R8	RM73B2A563F RN Resistor (CP)	323A5003F0563	3	
13	R9,R10	RM73B2A102J RN Resistor (CP)	323A5003J0102	2	
14	R11,R12	RM73B2A153J RN Resistor (CP)	323A5003J0153	2	
15	R13~R16	RM73B2A821J RN Resistor (CP)	323A5003J0821	4	
16	R17,R18	RM73B2A510J RN Resistor (CP)	323A5003J0510	2	

Duplex Control PCB (LEX-PCB) Rev.2
(40498502 - 3/4)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
17	R19~R26	RM73B2A330J RN Resistor (CP)	323A5003J0330	8	
18	R27,R28	RM73B2A333J RN Resistor (CP)	323A5003J0333	2	
19	R29,R30	RM73B2A392J RN Resistor (CP)	323A5003J0392	2	
20	R31~R51	RM73B2A512J RN Resistor (CP)	323A5003J0512	20	
21	R51,R52	2125JPW Tip Jumper (CP)	323A5003P0001	2	
22					
23	C1	KMG50VB-47M 50V CE Capacitor 47μF	304A1164H1470	1	
24	C2	UVX/SME16VB-10-0A Capacitor Aluminium-P	3041103C1100	1	
25	C3~C6	CC2012CH1H680J 50V CC Capacitor (CP)	303A3007C0680	4	
26	C7~C10	CC2012SL1H102J 50V CC Capacitor (CP)	303A3007K0102	4	
27	C11~C18	CK2012F1H104Z 50V CK Capacitor (CP)	303A6008Z3104	8	
28	IC5	SN74LS38NS BIP Digital IC (SO)	700A0550N0038	1	
29	IC4	SN74LS373NS BIP Digital IC (SO)	700A0550N0373	1	
30	IC2	A2918SWH Analog-BIP Linear	7201826M0001	1	
31	IC6	PST592D-2 BIP Linear IC	720A4037M0015	1	
32	IC3	MSM65X512ARS Micro Computer-MOS	8510124M0001	1	

Duplex Control PCB (LEX-PCB) Rev.2
(40498502 - 4/4)

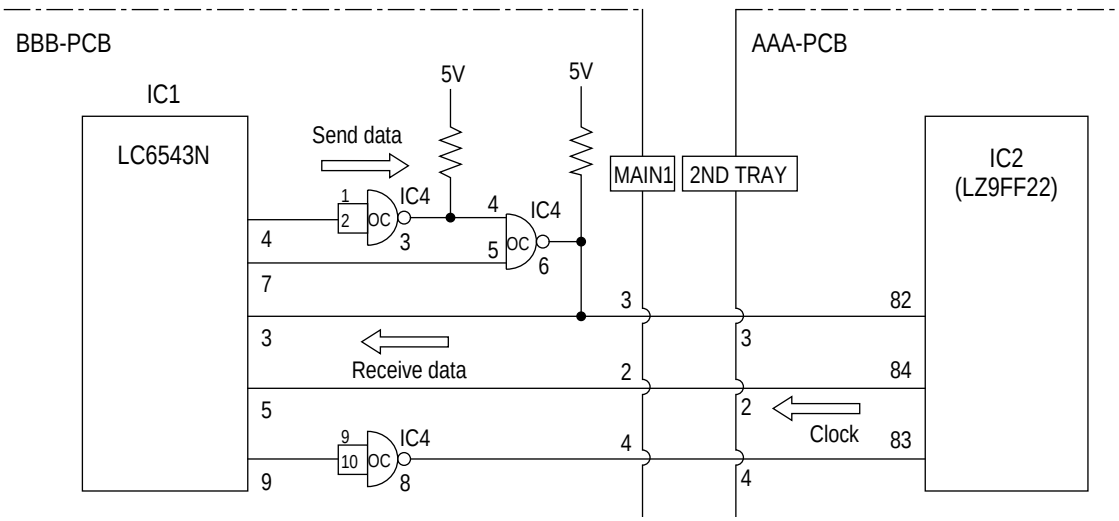
REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
33					
34	TR1	2SA1417S/T PNP-HF-TR (CP)	600A1032N0011	1	
35	TR2	2SA1248 PNP-HF-TR	600A1132M0001	1	
36	TR3,TR4	DTC124EK NPN-HF-TR (CP)	602A1035N0004	2	
37					
38	INSENS	175487-3 Connector-PCB	2244005P0030	1	
39	FSENS,MOTOR	175487-4 Connector-PCB	2244005P0040	2	
40	CLUTCH,SL2	B2B-PH-K-S PC Connector	224A3529P0020	2	
41	MAIN	1-175487-2 PC Connector	224A4322P0120	1	
42					
43	OSC1	CST10.0MTW Ceramic Oscillator	381A1045B0014	1	
44	FU1	251-002 Fuse	540A2208S1202	1	
45	SENSER	RPI-574/#9568 Photocoupler	652A0103M0002	1	
46					
47		Screw	PSW2W3-8C	2	
48		Nut	3N3-HH	2	

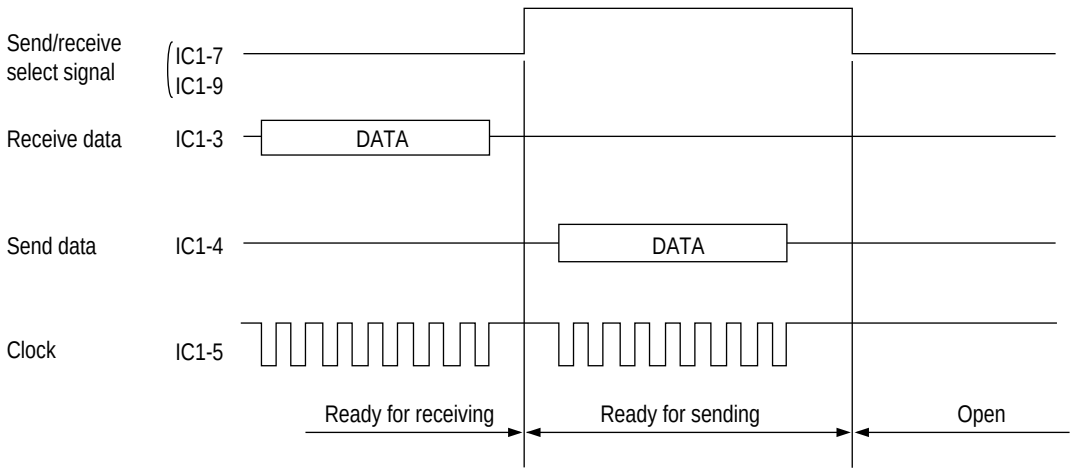
APPENDIX B HIGH CAPACITY SECOND/THIRD PAPER FEEDER (OPTION)

1. CIRCUIT DESCRIPTION

1.1 Interface

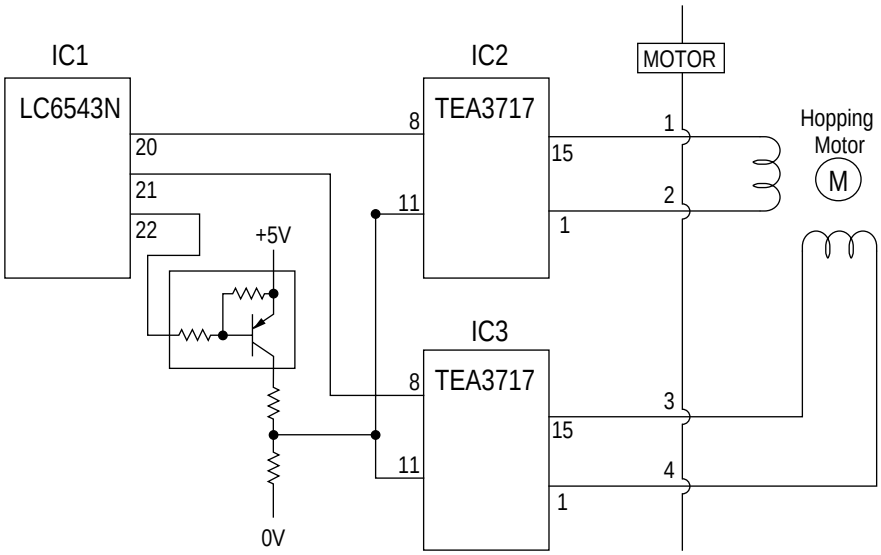
IC1 (LC6543N) uses a single line for transferring data to and from the CPU on the main unit side by performing the switchover between sending and receiving. To receive data from the CPU on the main unit side, IC1 (LC6543N) causes the send/receive select signal at pin 7 of IC1 to be LOW in order to drive the open collector output (pin 6 of IC4) to the high impedance state. As a result, the line in the send direction is open and the receive data ready state is established. To send data to the CPU on the main unit side, IC1 causes the send/receive select signal (pin 7 of IC1) to be HIGH, so that the send data ready state can be established. Under this condition, IC1 can send out data through pin 4. When finishing data transmission, IC1 causes the send/receive select signal (pin 7 of IC1) to be LOW to open the send direction of the line.

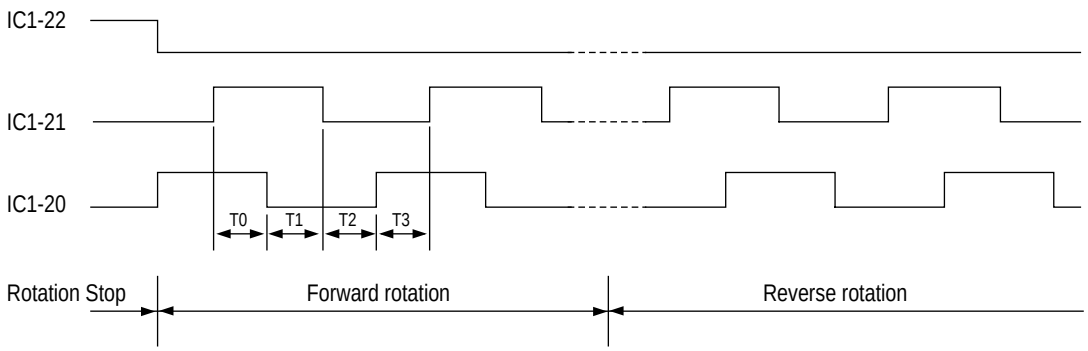




1.2 Motor Control

The hopping motor is driven by the driver IC according to the control signal from IC1 (LC6543N). The hopping motor will drive either the hopping roller or the feed roller depending on the rotation direction of the motor.





2. TROUBLESHOOTING

2.1 Troubleshooting Table

(A) Interface/motor control board (BBB)

Failure	LCD Message	Flowchart No.
Paper input JAM occurs.	PAPER INPUT JAM CHECK TRAY*	A - 1
Paper size ERROR occurs.	ERROR PAPER SIZE CHECK TRAY*	A - 2
The message "PAPER OUT" remains displayed on the LCD.	PAPER OUT ********* TRAY*	A - 3
The message "PAPER NEAREND T*" remains displayed on the LCD.	 PAPER NEAREND T*	A - 4
Option Tray I/F timeout error occurs.	ERROR 81	A - 5

* : 2 or 3

(B) Cassette switch board (PXC)

Failure	LCD Message	Flowchart No.
Paper size error occurs.	ERROR PAPER SIZE CHECK TRAY*	B - 1

* : 2 or 3

2.2 Troubleshooting Flowchart

A-1 Paper input JAM occurs.

- Is the hopping motor rotating normally?
  - No — Are the normal waveforms as shown in section 1.2 output to pins 20, 21 and 22 of IC1 (LC6543N)?
    - • No — Replace IC1 (LC6543N).
  - Yes — Is +38V output to pin 3 and 14 of IC2 and IC3 (TEA3717)?
    - • No — Replace F1 (fuse).
  - Yes — Replace IC2 (TEA3717).
  - OK?
  - No — Replace IC3 (TEA3717).
- Yes — Failure of an element other than BBB-PCB

A-2 Paper size ERROR occurs.

- Do the output signals at pins 11, 12, 13 and 14 of IC1 (LC6543N) comply with the following table?

Paper size	Pin 11	Pin 12	Pin 13	Pin 14
Letter	L	H	H	H
Executive	L	H	L	H
A4	L	L	H	H
Legal 14	H	H	H	L
Legal 13	H	L	H	H
B5	H	H	L	H
A5	H	H	L	L

  - • No — Check to see if the SW1 to SW4 on PXC-PCB are set properly?
- Yes — Replace IC1 (LC6543N).

A-3 The message "PAPER OUT" remains displayed on the LCD.

- Is END (Paper END Sensor) operating normally?
  - • No — Replace END.
- Yes — Replace IC1 (LC6543N).

A-4 The message "PAPER NEAREND T*" remains displayed on the LCD.

- Is LOW (Paper nearend sensor) operating normally?
  - • No Replace LOW.
- Yes Does the signal at the 2 pin of the Q3 (transistor) normally?
  - • No Replace Q3.
- Yes Replace IC1 (LC6543N).

A-5 Option Tray I/F timeout error.

- Is the normal clock as shown in section 1.1 output to pin 5 of IC1 (LC6543N)?
  - • No Failure of AAA-PCB on the main unit side.
- Yes Is the normal receive data as shown in section 1.1 output to pin 3 of IC1(LC6543N)?
  - • No Is the level on pin 4 or 5 of IC4 (LS38) HIGH at all time?
    - • No Replace IC4 (LS38).
    - OK?
    - • No Failure of AAA-PCB on the main unit side.
  - • Yes Replace IC1 (LC6543N).
- Yes Is the normal send data as shown in section 1.1 output to pin 3 of IC1 (LC6543N)?
  - • No Is the normal send data as shown in section 1.1 output to pin 4 of IC1 (LC6543N)?
    - • Yes Replace IC4 (LS38).
  - • No Replace IC1 (LC6543N)
- Yes Failure of AAA-PCB on the main unit side.

B-1 PAPER SIZE ERROR occurs.

- Does the PAPER SIZE 1 signal at pin 4 of CN11 go LOW when SW1 is depressed and does the same signal go HIGH when SW1 is not depressed?
  - No Replace SW1.
- Yes Does the PAPER SIZE 1 signal at pin 3 of CN11 go LOW when SW2 is depressed and does the same signal go HIGH when SW2 is not depressed?
  - No Replace SW2.
- Yes Does the PAPER SIZE 2 signal at pin 2 of CN11 go LOW when SW3 is depressed and does the same signal go HIGH when SW3 is not depressed?
  - No Replace SW3.
- Yes Does not PAPER SIZE 3 signal at pin 1 of CN11 go LOW when SW4 is depressed and does the same signal go HIGH when SW4 is not depressed?
  - No Replace SW4.
- Yes Replace flexible cable.

3. CIRCUIT DIAGRAM

Figure 3-1(1/1) Control-PCB (BBB-PCB, Rev.2)

Figure 3-2(1/1) Cassette Switch-PCB (PXC-PCB, Rev.3)

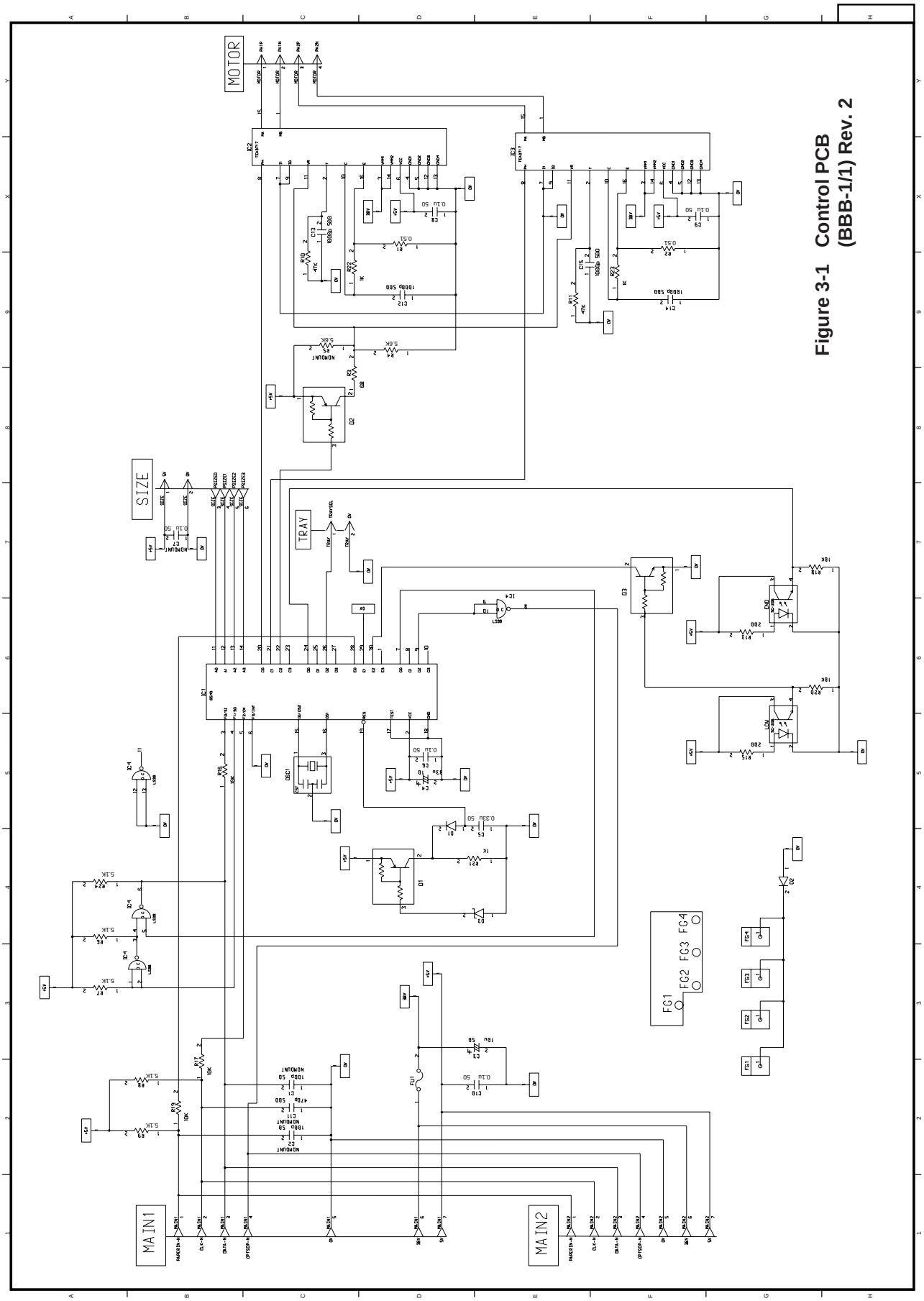


Figure 3-1 Control PCB (BBB-1/1) Rev. 2

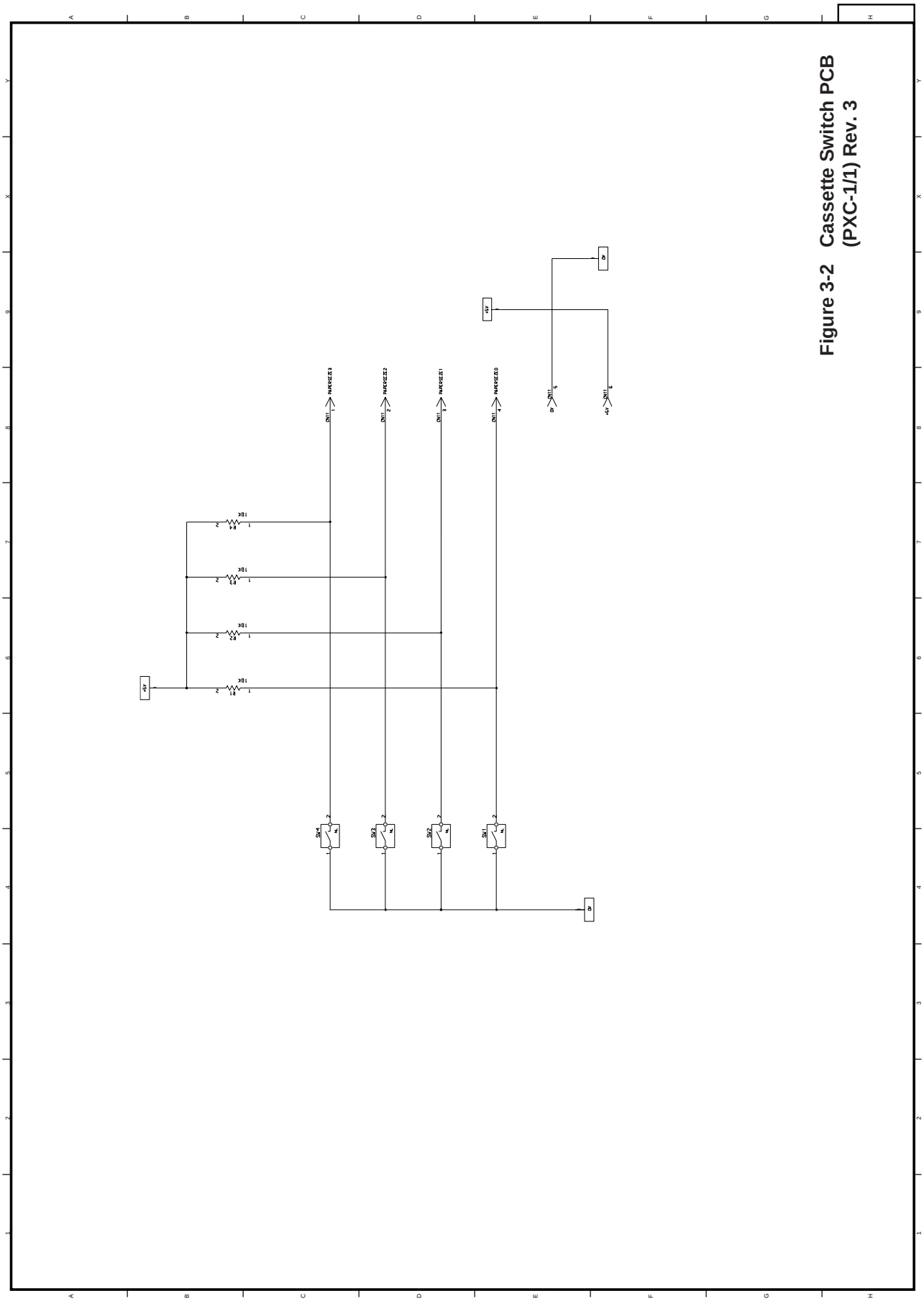
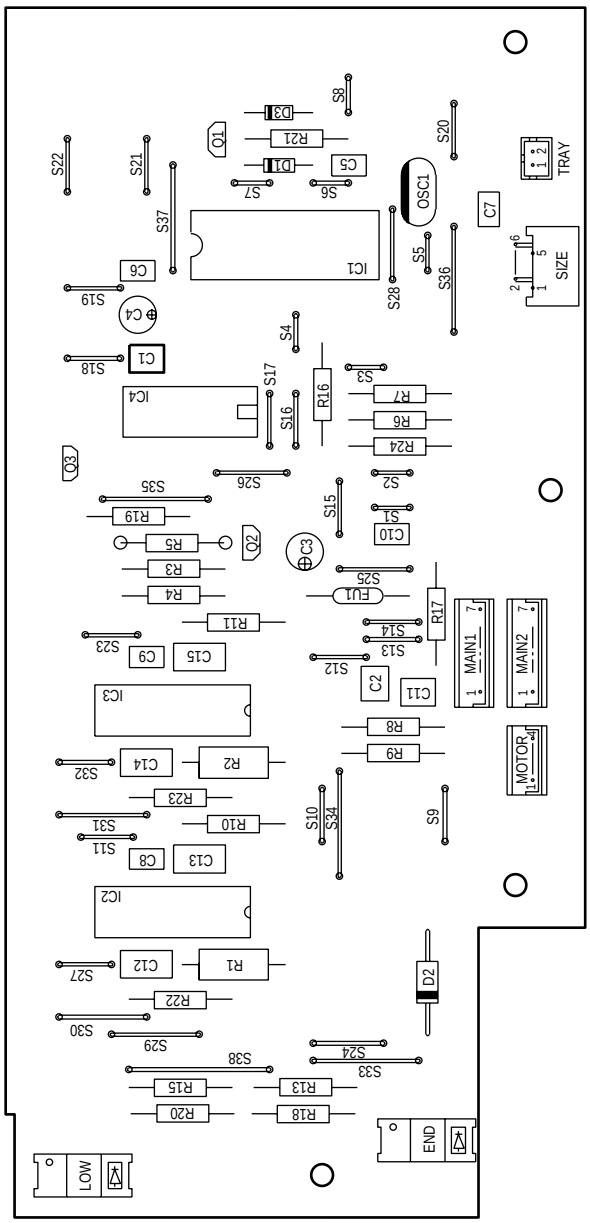


Figure 3-2 Cassette Switch PCB (PXC-1/1) Rev. 3

4. COMPONENT PARTS LIST

Control-PCB	(BBB-PCB, Rev.2)	40387101
Cassette Switch-PCB	(PXC-PCB, Rev.3)	40368303



Control PCB (BBB-PCB) Rev. 2
(40387001 - 1/4)

Control PCB(BBB-PCB) Rev.2
(40387001 - 2/4)

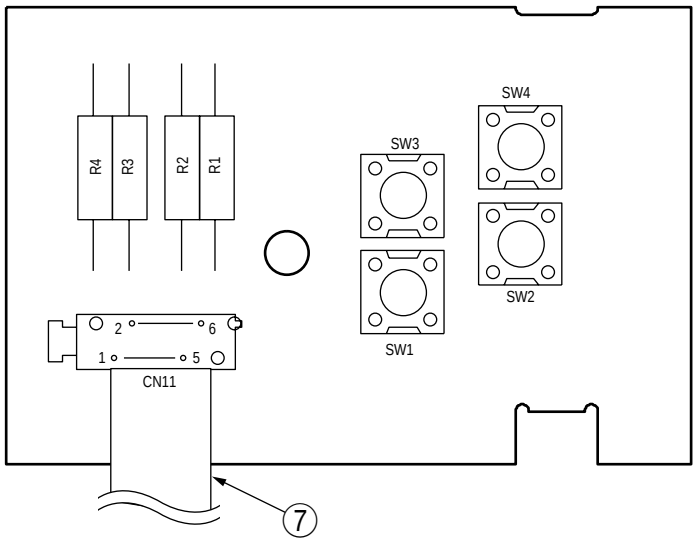
REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1	D1	1S953/1S2075K/1S2473 Signal DI	611A0003L0001	1	
2	D2	EM01Z/SM1XN02/DSM1D2 Rectifying DI	610A0003M0001	1	
3	D3	RD3.9E-B Zener DI	613A1231L0082	1	
4					
5	R21~R23	RD1/4Y1KΩJ RD Registor	321A1421J0102	3	
6	R16~R20	RD1/4Y1KΩJ RD Registor	321A1421J0103	5	
7	R13,R15	RD1/4Y200ΩJ RD Registor	321A1421J0201	2	
8	R10,R11	RD1/4Y47KΩJ RD Registor	321A1421J0473	2	
9	R6~R9,R24	RD1/4Y5.1KΩJ RD Registor	321A1421J0512	5	
10	R4	RD1/4Y5.6KΩJ RD Registor	321A1421J0562	1	
11	R3	RD1/4Y68ΩJ RD Registor	321A1421J0680	1	
12	R1,R2	MSF1/2B0.51ΩJ RS Registor	324A1001J0518	2	
13					
14	C12~C15	DD07-63B102K500 500V CK Capacitor 1000pF	302A4003K6102	4	
15	C6,C8~C10	CK92F1H104ZY 50V CK Capacitor 0.1μF	303A0420Z3104	4	
16	C5	CK92F1H334ZS 50V CK Capacitor 0.33μF	303A4117Z3334	1	

Control PCB(BBB-PCB) Rev.2
(40387001 - 3/4)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
17	C4	10MS5-33M 10V CE Capacitor 33µF	304A1046A1330	1	
18	C3	KMG50VB-10M 50V CE Capacitor 10µF	304A1164H1100	1	
19					
20	IC4	74LS38P BIP Digital IC	700A0503M0038	1	
21	IC2,IC3	TEA3717DP BIP Linear IC	720A1889M0001	2	
22	IC1	LC6543N-4B52 MOS-CPU(ROM)	853A0036M0002	1	
23	Q1,Q2	DTA114S PNP-HF-TR	600A1035M0005	2	
24	Q3	DTC114ESA NPN-HF-TR	602A1035M0007	1	
25					
26	TRAY	B2B-PH-K-S PC Connector	224A3529P0020	1	
27	MAIN1,MAIN2	175487-7 PC Connector	224A4322P0070	2	
28	SIZE	06FE-ST-VK-N Connector-PC board	2244101P0060	1	
29	MOTOR	175487-4 Connector-PC board	2244005P0040	1	
30					
31	OSC1	CST4.00MGW Ceramic Oscillator	381A1025B0002	1	
32					

Control PCB(BBB-PCB) Rev.2
(40387001 - 4/4)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
33	FU1	251-001 Fuse	540A2208S1102	1	
34					
35	END,LOW	RPI-574/#9568 Photocoupler	652A0103M0002	2	
36					
37	S24~S26,S28	0.6	TA-0.6	4	L=32,P=10.16
38	S29~S31	0.6	TA-0.6	3	L=32,P=12.7
39	S33~S37	0.6	TA-0.6	5	L=32,P=15.24
40	S38	Short wire(U-shape) 0.65 P=20	KH-31036-200	1	
41	S1~S8	0.6	TA-0.6	8	L=32,P=5.08
42	S9~S23,S27,S32	0.6	TA-0.6	12	L=32,P=7.62
43					
44					
45					
46					
47					
48					



Cassette Switch PCB(PXC-PCB) Rev.3
(40368602 - 1/2)

Cassette Switch PCB(PXC-PCB) Rev.3
(40368602 - 2/2)

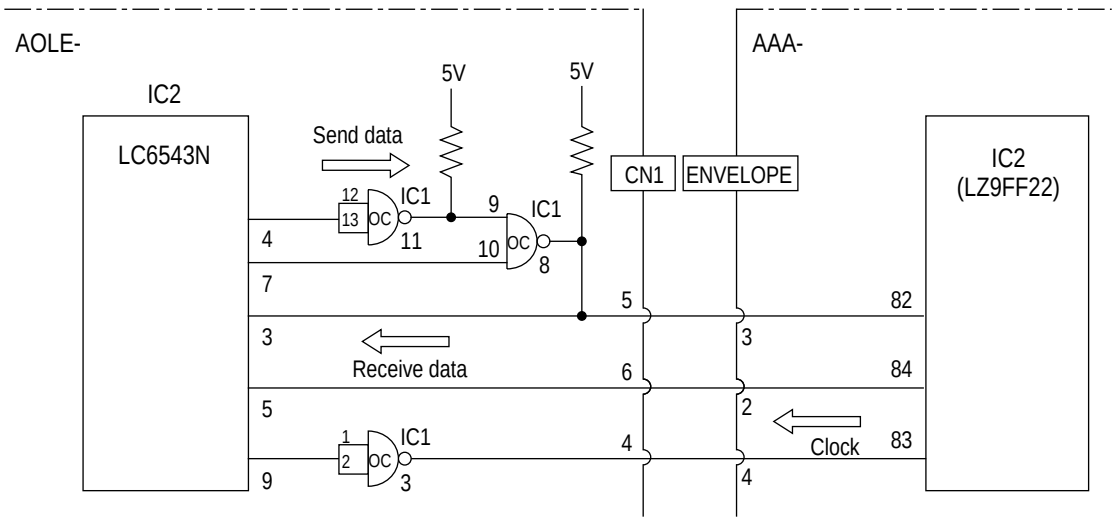
REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1	SW1~SW4	SOR-113HS Push Button Switch	205A1165P1000	4	
2					
3	CN11	00-5062-301-006-000 PC Connector	224A5114P0060	1	
4					
5	R1~R4	RD1/4Y10KΩJ RD Resistor (CP)	321A1421J0103	4	
6					
7		SMCD6X370ESX10(BL) Connector	2381007P0002	1	
8					
9					
10					
11					
12					
13					
14					
15					
16					

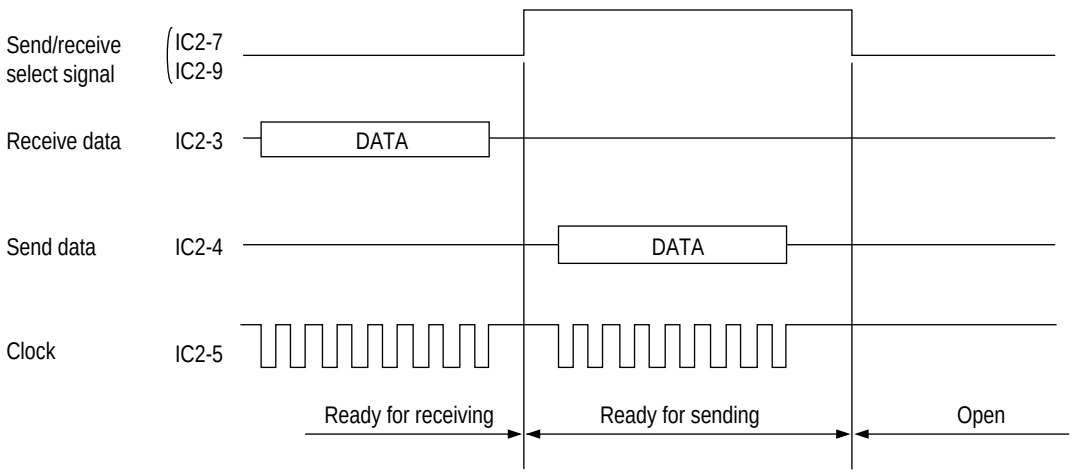
APPENDIX C MULTI PURPOSE FEEDER (OPTION)

1. CIRCUIT DESCRIPTION

1.1 Interface

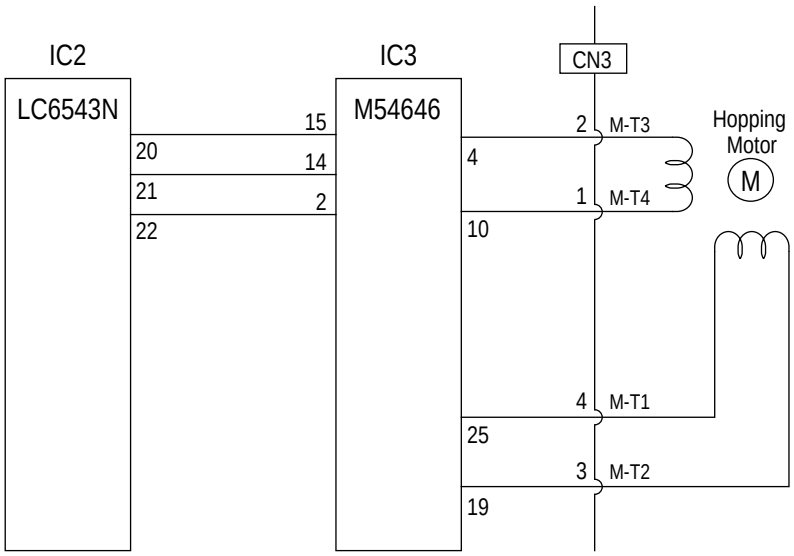
IC2 (LC6543N) uses a single line for transferring data to and from the CPU on the main unit side by performing the switchover between sending and receiving. To receive data from the CPU on the main unit side, IC2 (LC6543N) causes the send/receive select signal at pin 7 of IC2 to be LOW in order to drive the open collector output (pin 8 of IC1) to the high impedance state. As a result, the line in the send direction is open and the receive data ready state is established. To send data to the CPU on the main unit side, IC2 causes the send/receive select signal (pin 7 of IC2) to be HIGH, so that the send data ready state can be established. Under this condition, IC2 can send out data through pin 4. When finishing data transmission, IC2 causes the send/receive select signal (pin 7 of IC2) to be LOW to open the send direction of the line.

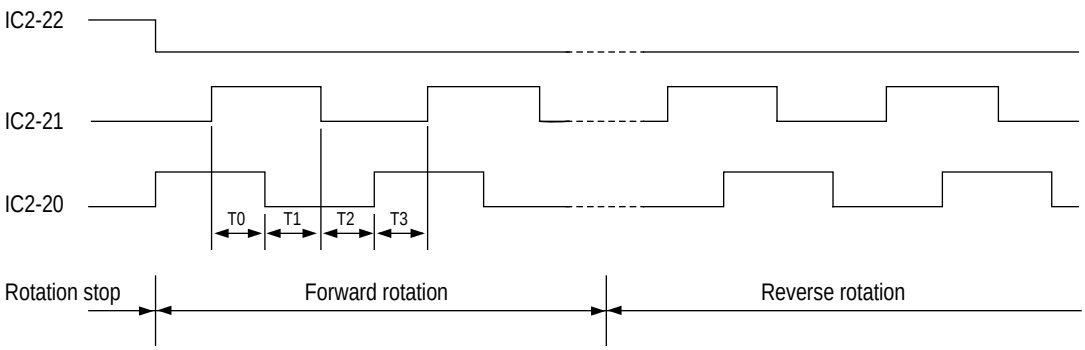




1.2 Motor Control

The hopping motor is driven by the driver IC according to the control signal from IC2 (LC6543N). The hopping motor will drive either the hopping roller or the feed roller depending on the rotation direction of the motor.





2. TROUBLESHOOTING

2.1 Troubleshooting Table

(A) Interface/motor control board (AOLE)

Failure	LCD Message	Flowchart No.
Paper input JAM occurs.	PAPER INPUT JAM CHECK FEEDER	A - 1
The message "PAPER OUT" remains displayed on the LCD.	PAPER OUT ********FEEDER	A - 2
Option Tray I/F timeout error occurs.	ERROR 81	A - 3

2.2 Troubleshooting Flowchart

A-1 Paper input JAM occurs.

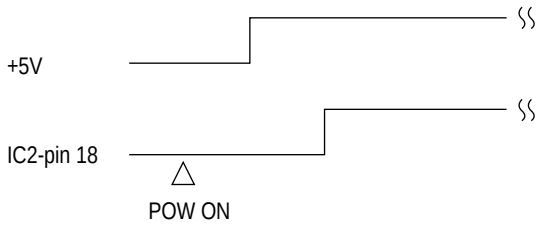
- Is the hopping motor rotating normally?
  - No — Are the normal waveforms as shown in section 1.2 output to pins 20 and 21 of IC2 (LC6543N)?
    - No — Replace IC2 (LC6543N).
  - Yes — Does the output at pin 2 of IC3 (M54646) go HIGH when the motor is rotating?
    - No — Is the normal waveform as shown in section 1.1 output to pin 22 of IC2 (LC6543N)?
      - No — Replace IC2 (LC6543N).
    - Yes — Replace TR1 (DTA114).
  - Yes — Is +38V output to pin 3 of IC3 (M54646)?
    - No — Replace F1 (fuse).
    - OK?
    - No — Replace D1 (diode).
    - OK?
    - No — Replace D2 (diode).
  - Yes — Replace IC3 (M54646).

A-2 The message "PAPER OUT" remains displayed on the LCD.

- Is SEN2 (Paper END Sensor) operating normally?
  - No — Replace SEN2.
- Yes — Replace IC2 (LC6543N).

A-3 Option Tray I/F timeout error.

- Is the normal clock as shown in section 1.1 output to pin 5 of IC2 (LC6543N)?
  - No: Failure of AAA-PCB on the main unit side
  - Yes: Is the normal receive data as shown in section 1.1 output to pin 3 of IC2 (LC6543N)?
    - No: Is the level on pin 9 or 10 of IC1 (LS38) HIGH at all time?
      - No: Replace IC1 (LS38).
      - OK?
      - No: Failure of AAA-PCB on the main unit side
    - Yes: Replace IC2 (LC6543N).
  - Yes: Is the normal send data as shown in section 1.1 output to pin 3 of IC2 (LC6543N)?
    - No: Is the normal send data as shown in section 1.1 output to pin 4 of IC2 (LC6543N)?
      - Yes: Replace IC1 (LS38).
    - No: Is an oscillation waveform output to pin 15 of IC2 (LC6543N)?
      - No: Replace OSC1 (oscillator).
      - OK?
      - No: Replace IC2 (LC6543N).
    - Yes: Is the following reset waveform output at pin 18 of IC2 (LC6543N)?



      - No: Replace TR2 (DTA114K).
      - OK?
      - No: Replace D3 (diode).
      - OK?
      - No: Replace D4 (RD3.9E-B).
    - Yes: Replace IC2 (LC6543N)
  - Yes: Failure of AAA-PCB on the main unit side

3. CIRCUIT DIAGRAM

Figure 3-1(1/1) Control-PCB (AOLE-PCB, Rev.1)

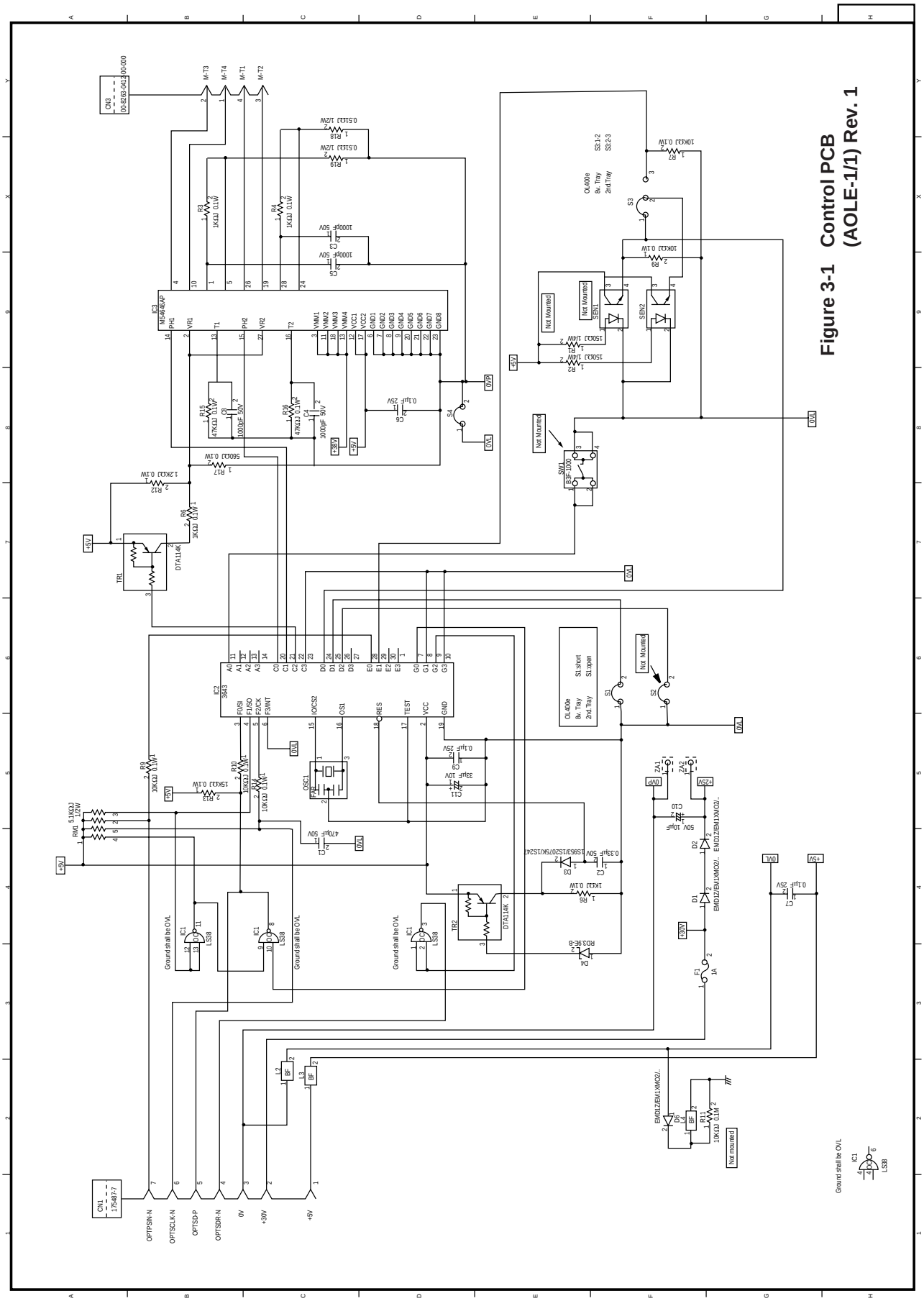
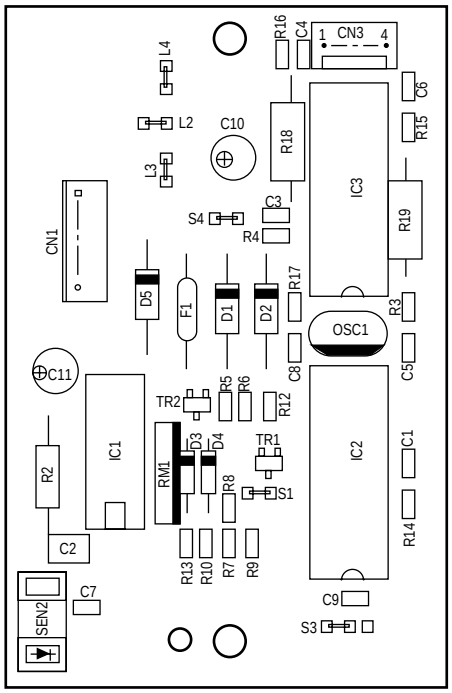


Figure 3-1 Control PCB (AOLE-1/1) Rev. 1

4. COMPONENT PARTS LIST

Control-PCB	(AOLE-PCB, Rev.1)	4YA4046-1647G11



AOLE-Printed Circuit Board
(4YA4046-1647G001 - 1/4)

AOLE-Printed Circuit Board
(4YA4046-1647G001 - 2/4)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
1					
2					
3	D1, D2, D5	EM01Z/SM1XN02/DSM1D2 Rectifier DI	610A0003M0001	3	
4	D4	RD3.9E-B Zenor DI	613A1231L0082	1	
5	D3	1S953/1S2075K/1S2473 Signal DI	611A0003L0001	1	
6					
7	R15, R16	RM73B2A473J RN Resistor (CP)	323A5003J0473	2	
8	R18, R19	MSF1/2B0.51WJ RS Resistor	324A1001J0518	2	
9	R3-R6	RM73B2A102J RN Resistor (CP)	323A5003J0102	4	
10	R2	RD1/4Y180WJ RD Resistor	321A1421J0181	1	
11	R7-R10, R14	RM73B2A103J RN Resistor (CP)	323A5003J0103	5	
12	R12	RM73B2A363J RN Resistor (CP)	323A5003J0363	1	
13	R17	RM73B2A182J RN Resistor (CP)	323A5003J0182	1	
14	R13	RM73B2A153J RN Resistor (CP)	323A5003J0153	1	
15	RM1	MRM-4-512JA Block Resistor	334A3266J0512	1	
16					

AOLE-Printed Circuit Board
(4YA4046-1647G001 - 3/4)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
17	C10	KMG50VB-10M 50V CE Capacitor 10UF	304A1164H1100	1	
18	C11	10MS5-33M 10V CE Capacitor 33UF	304A1046A1330	1	
19	C2	RPE122-127E334M50 CK Capacitor 0.33UF	303A4116M3334	1	
20	C1	CC2012SL1H471J 50V CC Capacitor (CP)	303A3007K0471	1	
21	C3-C6	CK2012B1H102K 50V CK Capacitor (CP)	303A6008K3102	4	
22	C7-C9	CK2012F1E104Z 25V CK Capacitor (CP)	303A6008Z2104	3	
23					
24	IC3	M54646AP BIP Linear IC	720A1822M0002	1	
25	IC1	74LS38P BIP Digital IC	700A0503M0038	1	
26	IC2	LC6543N-4B52 MOS-CPU (ROM)	853A0036M0002	1	
27					
28	SEN2	SG-205-B Photocoupler	652A0114M0001	1	
29	TR1, TR2	A1344/UN2111/DTA114K PNP-HF-TR (CP)	600A1003N0003	2	
30	OSC1	CST4.000MGW Ceramic Oscillator	381A1025B0002	1	
31					
32	S1, S3, S4, L2-L4	Short Wire (U-type) 0.65 P = 2.5	5KH-31036-26	6	

AOLE-Printed Circuit Board
(4YA4046-1647G001 - 4/4)

REF. NO.	SYMBOL	TYPE/NAME	PART NO.	Q'TY	REMARKS
33	F1	251-001 Fuse	540A2208S1102	1	
34					
35	CN3	00-8263-0412-00-000 PC Connector	224A3357P0040	1	
36					
37	CN1	175487-7 PC Connector	224A4322P0070	1	
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					

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